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The Archibald Watson Memorial Lecture.[1]

THE NATURALIST IN MEDICINE WITH PARTICULAR REFERENCE TO AUSTRALIA.

By J. BURTON CLELAND,

Adelaide.

IT is two hundred years since the birth of Edward Jenner. His observations and deductions on the cowpox led to one of the greatest advances in the control of disease. Many addresses have been given recently in honour of this bicentenary. A hundred years later, on July 27, 1849, Archibald Watson was born near Albury. During the course of his medical career as professor of anatomy in the University of Adelaide, he contributed more than anyone else in Australia to the application of anatomical knowledge in the fullest extent to surgical procedures. So valuable were his observations and recommendations that his fame extended to Britain and the Continent of Europe and the United States, and he was welcomed with enthusiasm by surgeons and anatomists wherever he went. Sir Henry Newland, in the first Archibald Watson Memorial Lecture given in Adelaide on May 1, 1947, in a magnificent address, presented the main facts of Watson's medical career and showed clearly what a large part he took in the advance of surgery in Australia and abroad. Sir Henry also gave biographical details and anecdotes and impressions so vividly and so fully that he has left to his successors in these lectures little fresh to add in these respects. Re-reading that lecture, I am only too conscious how greatly my own contribution falls short of the excellency of the first.

It is indeed a great honour and a great privilege to have been asked to undertake the task—a pleasurable task, it is true—of giving this the second Watson Lecture. I presume that the main reason for my selection was that, like Sir Henry Newland, I am one of Archibald Watson's earlier students and had close personal association with him and was brought up medically in the Watson tradition. Coming from a medical family, I was somewhat prepared for the remarkable personality that overshadowed all others when I commenced my course in 1895. "Wattie" was held in the most affectionate regard by all his students. He gave no set lectures in anatomy, but his demonstrations and talks, illustrated by sketches, on points of anatomical and particularly surgical importance impressed us more lastingly than could any lecture or text-book. He would approach his subject of instruction with some anecdote or experience having often, as far as one could see, no possible connexion with anatomy. He would seemingly ramble on discursively and we would wonder what his talk was leading up to, and then finally would come its application to an anatomical fact or surgical procedure. I have heard Professor Wood Jones, with all his flair for making dry bones live, say that he sometimes wondered whether Watson's wayward teaching of anatomy did not produce a more lasting impression than the more orthodox lecturing of his successors in the chair. The notorious "Adelaide Hospital trouble" began in my second year, and in 1897 the men in the two senior years had to leave Adelaide for Melbourne or Sydney and the Adelaide Hospital was closed so far as medical teaching was concerned. Consequently I had no opportunity of witnessing the great help that Professor Watson furnished to the surgeons in proposing modifications in the technique of operations suggested by his profound knowledge of anatomy. We did hear many

[1] Delivered at a meeting of The Royal Australasian College of Physicians on November 11, 1949, in Melbourne.

dissertations on hysterectomy for fibromyomata, however, and see numerous sketches in support of his views, as this was a subject in which he was particularly interested at that time.

"Wattie" had a keen sense of humour and anecdotes of him are legion. I am sure he enjoyed himself immensely in furnishing matter for them, and I believe he rather played up to them. He was no respecter of persons in his attire, and in his appearance he might have been anyone from a tramp to a professor. He was a great friend of Mr. and Mrs. R. Barr Smith and often dropped in for a meal. On one occasion when they were at Mount Barker he was expected for lunch. When a new maid, who did not know "Wattie", answered his ring, he announced: "I've come for my tucker." She, knowing the generous hospitality of Mrs. Barr Smith and taking Watson for a tramp, told him to go round the back and she'd bring him a plate of food. So

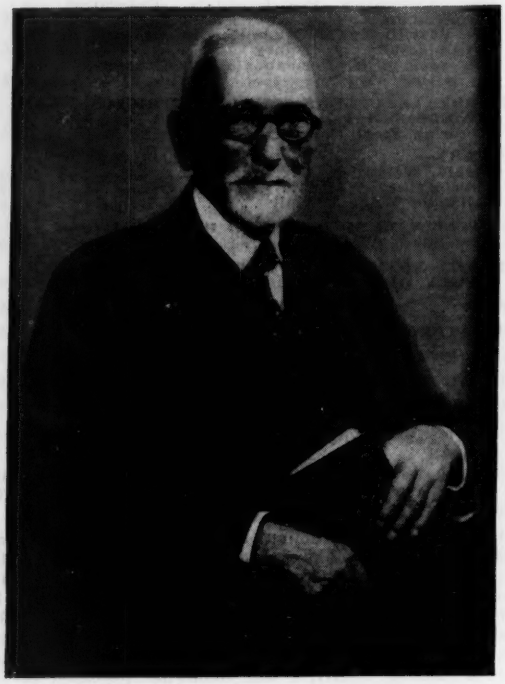

Figure I.

Professor Archibald Watson. Photograph by Dr. Julian A. R. Smith, 1936 (original in the possession of Mr. Hedley Marston, F.R.S.).

"Wattie", chuckling to himself I feel certain, went round and sat on a form under a tree in the backyard. He had not proceeded far with his meal when Mrs. Barr Smith, glancing out of an upstairs window, to her dismay found her expected and honoured guest so engaged.

Stories of Watson's adventurous career in the Pacific Islands are few. From some source now forgotten, the substance of the following was related to me. I am afraid it is apocryphal, but Mr. Marston tells me that it is so typical that it might quite well be true.

Not many years before his death, Professor Watson and a friend happened to enter a bush "pub" in the back-blocks of Queensland for the purpose of having drinks. As they approached the bar, the face of the barman underwent a dramatic change and he looked on "Wattie" with a mixed expression of abhorrence and fear as he burst out with the remark, pointing at Professor Watson: "You're the man who tried to hang me!" Needless to say, "Wattie" and his friend beat a hasty retreat. It appeared that in his youthful days, "Wattie", during his journeyings amongst the Pacific islands, had become the right-hand man of the Administrator of some small place. In the ordinary course of events, all kinds of matters had to receive attention, and, on one occasion, the captain of some small craft was tried for murder or other crime to which the death penalty was attached; he was found guilty and the sentence of death was pronounced. This was all very well, but when it came to carrying the sentence into effect, there was no one else to do it save Watson himself. So with considerable reluctance he made the necessary preparations, rather crude perhaps, but seemingly satisfactory, threw a rope over a branch of a tree and induced the condemned man to stand on a soap-box. The noose was placed round his neck, but unfortunately, before the knot was properly adjusted, the box slipped and the poor victim was left suspended, half-strangled, but by no means dead or likely to die. "Wattie" tried all kinds of devices to effect the desired end, but all in vain. The criminal would not die. At last, in despair, he was cut down and removed to a hut whilst the Administrator and his aide, Professor Watson, read rapidly over the instructions issued to officials to find out what course of action they must now follow. Though they pored through the pages till the sweat came out on their brows, nowhere could they find any guide as to what to do when you had tried to hang a man and had been unsuccessful. All other contingencies seemingly had been provided for with the exception of this. Weighed down by anxiety and still uncertain as to what to do, at length the two retired to sleep as best they could. With heavy hearts and unrefreshed they woke next morning early, when to their vast relief they found that during the night the shipmates of the condemned man had broken into the hut where he had been confined and had carried him off. This was the man that fifty years or more later "Wattie" had encountered behind the bar in Queensland.

Sir Henry, in his address, said that Watson "attended the wards of Jonathan Hutchinson, senior, the great Quaker surgeon . . . a man of omnivorous interests, and I have little doubt that he spurred Watson on to adopt a similar course and to make a note of everything". I think this was almost certainly the case. One has only to compare the account of cases quoted by Jonathan Hutchinson in "A Clinical Memoir on Certain Diseases of the Eye and Ear Consequent on Inherited Syphilis", published in 1863, with the very full notes made by Watson on nearly every surgical case that he was interested in, to see the resemblance. I think, however, that the urge to take notes was already in Watson. He had kept a diary during his voyage with Dr. James Patrick Murray in the brig *Carl*. Through the kindness of Mr. Marston I have been privileged to glance through this and to make the following extracts, which incidentally indicate clearly the then mental condition of Dr. Murray:

> Saturday, 30th March [1872]. Splendid west wind. All sails set. Doctor very sick and foolish. Caught another booby. Had a heavy rain squall at 10 min. past 2 a.m. . . .
>
> Tuesday, 2nd April. . . . after tea the Doctor made a rush on deck tomahawk in hand and threw himself into the sea over the quarter and tried to swim away from the ship. Saul cut the lashings of the boat and he and Scotty and Jim and 2 Tanna men quickly pulled after him before he sank. He was nearly choked with salt water. I kept awake all night lest he should try it again.
>
> Wednesday, 10th. Doctor in a terrible state lying amongst the natives whom he got to drench him with buckets of salt water. Mind wandering very much.
>
> 12th. Passed Rotumali in night.
>
> 14th. . . . off Hunter's Island.

Those who keep diaries almost inevitably become note-makers. It is a matter of regret that Watson published so little with such a wealth of recorded observations.

David Lindsay, leader of the Elder Exploring Expedition of 1891, from northern South Australia across to Western Australia, on July 8, three days before reaching the Birksgate Range, named a mountain "in honour of Professor Archibald Watson, M.D., of the Adelaide University, as an appreciation of his kindness in assisting, as Sir Thomas Elder's agent, in the formation of the party". He and Mr. Wells climbed Mount Watson, which they found to be of granite, with a gum tree (the only tree) growing 125 links north of the summit. "We found the height by aneroid to be 2380 feet—750 feet above the base. The appearance of the country to the westward looked very inviting."

The plants collected during this expedition were identified by Baron von Mueller and Professor Ralph Tate. A myrtaceous shrub, *Calycothrix Watsoni*, collected in Western Australia 53 miles north-west of Fraser Range, was named in honour of Professor Watson "who, amidst other researches, aided also the expedition, during which this evidently rare plant was discovered". Two new Western Australian species of Goodenia were named respectively *Goodenia Elderi* and *Goodenia Watsoni*, the latter with a further reference to Watson as Sir Thomas Elder's representative.

In seeking a subject that would interest you and at the same time would have appealed to Archibald Watson, it occurred to me that natural history as applied to medicine would be a suitable one. Professor Watson's interest in comparative anatomy showed that he had the naturalist's type of mind. On my consulting Mr. Hedley Marston, F.R.S., of the Nutrition Laboratory in Adelaide, who is his literary executor, he approved of the selection of the subject and generously offered to allow me to consult some of Professor Watson's notes of his fishing and other experiences at Thursday Island, in South America, and elsewhere, which are full of observations on natural history. It appears that Watson not only kept a regular diary of all his doings, but also made many notes and kept much, if not all, of his correspondence. The notes were entered in little black books. These and his correspondence are all in Mr. Marston's custody and will probably be made use of by him in writing a full life of the professor as known to an intimate and affectionate disciple and friend.

It seemed then not inappropriate to choose as the main theme of this lecture "The Naturalist in Medicine with Particular Reference to Australia" and to consider what part the naturalist has played and is playing in the progress of medical knowledge amongst us and what contributions Australian medical men have made to the advance of natural history in general

A naturalist in the highest sense I look upon as an observer, as a recorder and as an interpreter—a close and accurate observer with a fund of previous knowledge as his background, a trustworthy recorder, sharply distinguishing between facts and inferences, and a wise and cautious but when necessary bold interpreter. Now to these qualities has only to be added clinical application of the interpretation and we have a picture of those medical men who, in the practice of their profession, have not only been most successful in treating disease but have also by their recording added to the sum of medical knowledge. These were the great men in old days—Harvey and John Hunter and Jenner; William Withering and Jonathan Hutchinson; and in Australia John White of the First Fleet, George Bennett, the two Bancrofts, James Cox, Verco and Stirling. Though they practised their profession but little, though doubtless that little was well done, we must add to those with Australian experience, Robert Brown, Sir Joseph Hooker, Charles Darwin and Thomas Huxley.

My subject thus seems to sort itself readily into three sections: the first, a brief account of some of our early distinguished medical naturalists and what they contributed; the second, what additions the naturalist has made to medical knowledge in Australia and conversely medical men have made to natural history; and thirdly, what contribution the naturalist type of mind can make to the advance of pathology and clinical medicine.

PART I. MEDICAL NATURALISTS.

Edward Jenner and the Botany of Cook's First Voyage.

It is, I think, of considerable interest to us to know that one of the greatest of medical naturalists, Edward Jenner, had an association with Australia. When Captain Cook returned from his First Voyage to the Pacific in 1771, with a rich collection of specimens collected by Banks and Solander, Edward Jenner, Dr. E. Ashworth Underwood tells us (*British Medical Journal*, May 21, 1949, page 881),

> was offered the job—no doubt a part-time one—of arranging the botanical specimens, and he did it well. According to one account he was even offered the post of naturalist to Cook's next expedition, but this could hardly have been the case.

We all know the intimate friendship that existed between John Hunter and Jenner. For two years, Jenner had been one of his house pupils, and for many years afterwards they corresponded on questions of natural history. No better examples of medical naturalists can be found than these two, and I think that I am safe in saying that the great advances they made in their day to medical knowledge were the products of the naturalist type of brain.

John White of the First Fleet and His Journal.

John White (1750-1832), Principal Surgeon, or as he styles himself in his "Journal of a Voyage to New South Wales" (1790), Surgeon General to the Settlement, sailed with Governor Arthur Phillip in the First Fleet and was responsible for the medical arrangements of the expedition. The first party landed at Sydney Cove on January 26, 1788, and in November of that year John White forwarded to Thomas Wilson in England the "Journal" which he had undertaken at his request and specimens of natural history that he hoped might tend to the promotion of his favourite science. The "Journal" was edited and published in 1790,

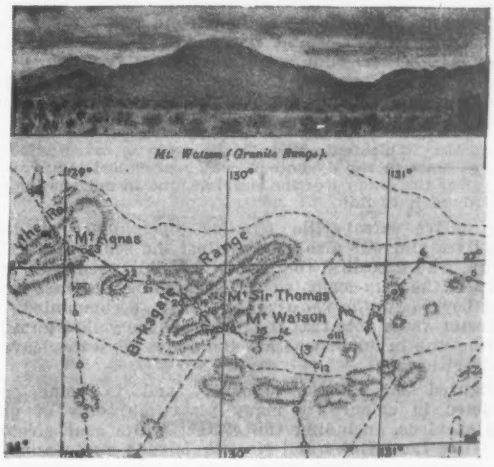

FIGURE II.

Mount Watson in the north-west of South Australia. Combined from an illustration on Plate III and portion of the map of the Elder Exploring Expedition (*Transactions of the Royal Society of South Australia*, Volume XVI, Part II, 1893).

with, as the title-page says, "Sixty-five Plates of Non Descript [that is, undescribed] Animals, Birds, Lizards, Serpents, curious Cones of Trees and other Natural Productions". The journal is of great general interest and particularly so to the medical man and naturalist. It shows clearly the care that White took to ensure the health of all on board the transports—sailors, marines, civilians and convicts. In spite of all precautions then known, scurvy did break out—"the gums of some of them were formed into such a fungus as nearly to envelope the teeth"—and White thought that shortage of drinking water precipitated its development. Essence of malt was considered the best antiscorbutic. An epidemic form of dysentery also appeared, though the only death attributed to it was probably due to something else, as the soldier concerned had "the most agonizing pain I ever was witness to". An outbreak of mumps, 17 cases in all, was invariably accompanied by orchitis, and the patients were benefited by an emetic or seasickness "in a most surprising and extraordinary manner". The total number of persons in the First Fleet has been estimated at 1482, of whom 771 were convicts. As only 45 deaths occurred amongst the convicts and three amongst the others during the passage of nearly eleven months, the medical supervision seems to have been reasonably successful for those days.

White made several excursions with Governor Phillip into the country round Sydney Cove—the town just escaped being called "Albion". He shot various birds and described them, but I am not sure whether these descriptions, often in considerable detail in the "Journal", are not in part interpolations by the editor from other sources. A very good description of the habits of the kangaroo is given. White notes that the tail is not made use of "in the act of progression", as some supposed. "Had it been used in such a manner, the hair would probably have been worn away from the part which, of course, must be applied to the ground." He thought the tail was probably used as a weapon. As even after landing the scurvy prevailed with great violence", a search was made for antiscorbutics. A good one was found in a small berry like a white currant, "which grew on a shrub resembling the common broom"; this, Mr. R. H. Anderson tells me, was evidently the native currant (*Leptomeria acida*). The quantity available was insufficient and others had to be sought for. These included a plant on the seashore resembling sage, samphire, a kind of wild spinach (probably *Tetragonia expansa*) and the vegetable tree, "the leaves of which prove rather a pleasant substitute for vegetables". White sent a quart of eucalyptus oil from the peppermint tree (*Eucalyptus piperita*) to Mr. Wilson—he had found it more efficacious than ordinary peppermint for removing all colicky complaints. The red gum tree (*Eucalyptus resinifera*)—and here we see the first use of the words "gum tree" as applied to our eucalypts and the reason for it—yielded a very powerful gum-resin.

> Mr. White administered it to a great number of patients in the dysentery, which prevailed much sooner after the landing of the convicts, and in not one instance found it to fail.

The native sarsaparilla (*Smilax glyciphylla*) yielded a sweet tea and was also used against the scurvy. Sir J. E. Smith, who described the plants, was intrigued with specimens of the gum-cemented leaf-sheaths of the grass-tree or blackboy (*Xanthorrhœa*); all that accompanied this material was a note that it came from the yellow gum tree, and he was in doubt whether the scales were the leaves or a parasitic plant.

Figured in White's "Journal" and in some copies depicted in colour are many plates not only of plants and of birds, including the extinct white coot (*Notornis alba*)[1] of Lord Howe and Norfolk Islands, the channel bill (*Scythrops novæ-hollandiæ*), the laughing jackass and others, and of marsupials and the dingo, but also of snakes, lizards, fishes, spiders, a centipede, crab, caterpillar and native implements. Based on the plate of a sea-horse, Bleeker in 1855 named the species *Hippocampus Whitei* after John White. The green tree frog, so familiar to many in New South Wales, is in the coloured copies depicted as a bright blue and is described as the blue frog, *Rana cærulea*; this was the result of a change of colour in a spirit specimen. The Australian emu is figured as the New Holland cassowary. The true Australian cassowary of Queensland was not described until 1854. The word "emu" is of Portuguese origin, from *ema*, first applied to the crane and then to the ostrich, and already in use in New South Wales in 1788 and 1789, but not by White. As the bird figured was called a cassowary, and such birds have bare skin of a rich purplish blue on the head and adjacent parts, the delineator of the plate has given the emu a deep blue neck. It is true that the skin on parts of the neck of the emu is nearly destitute of feathers and has a pale bluish tint, but the colour is nothing like that depicted. Under the date of February, 1788, White gives quite a long account of a New Holland cassowary (pages 129-131) that was brought into camp, and it was presumably on the skin of this specimen that the plate was based. Amongst other details he notes:

> This bird stands seven feet high, measuring from the ground to the upper part of the head. . . . On examining the viscera, they differed from that of every other species of the feathered kind which I had ever seen; particularly in having no gizzard, or second stomach; and the liver was so very small, that it did not exceed in size that of a blackbird. To this liver was joined a large gall-bladder, well distended with bile. . . . The intestinal canal was at least six yards long, very wide and of a regular cylindrical shape. . . . The heart and lungs were separated by a diaphragm or midriff.

Such a description of the first emu secured—the species was named *Casuarius novæ-hollandiæ* by Latham in 1790, two years later—suggests notes made by a medical man, and I think there is good reason for considering that White made them. White's "Journal" was published in 1790. In 1789, however, Captain Watkin Tench had published a small volume entitled "A Narrative of the Expedition to Botany Bay". In this appears also a description of this "New Holland cassowary", which measured seven feet two inches from the end of the toe to the tip of the beak and weighed seventy pounds.

> The gall-bladder was remarkably large. The liver not bigger than that of a barn-door fowl, and after the strictest search no gizzard could be found.

Presumably Captain Tench was present when the emu was dissected and notes the observations made at the time. The reference to the small size of the liver is curious,

Figure III.

Professor Watson with Herr Pretorius examining a manatee (related to the dugong) at Para near the mouth of the Amazon in October, 1928. (Photograph in the possession of Mr. H. Marston.)

and the accounts of its size do not agree. I am having inquiries made to ascertain if the liver is of the size expected for such a bird.

"The Voyage of Governor Phillip to Botany Bay . . . compiled from Authentic Papers, which have been obtained from the several Departments" was also published in London in 1789. In it are various natural history descriptions, such as that of the kino from the red gum tree used in dysentery, the plant that yielded the yellow gum (*Xanthorrhœa*), and descriptions and plates of birds, some such as the Banksian cockatoo and the white fulica, the same species but not the same plates as are figured in White's "Journal". Perhaps White was responsible for this information. The ex-convict George Barrington, in "The History of New South Wales . . ." (1802), acknowledges free use of previous descriptions evidently from these sources in his accounts of the animals and birds.

Captain Watkin Tench, in "A Complete Account of the Settlement at Port Jackson in New South Wales" (1793), says (page 189) that

> our surgeons grew into their esteem. . . . In a very early stage of intercourse, several natives were present at the amputation of a leg: when they first penetrated the intention of the operator, they were confounded; not believing it possible that such an operation could be

[1] It is of interest to note that a member of our profession, Dr. G. B. Orbell, of Invercargill, has been the rediscoverer in 1948 in the South Island of New Zealand of the allied giant gallinule, *Notornis mantelli*, named by Owen and believed to be extinct.

> performed without loss of life; and they called aloud for him to desist: but when they saw the torrent of blood stopped, the vessels taken up, and the stump dressed, their horror and alarm yielded to astonishment and admiration, which they expressed by the loudest tokens.

Tench adds: "If these instances bespeak not nature and good sense, I have yet to learn the meaning of the terms." It was evidently Surgeon-General White who performed this operation, as Tench mentions (page 97) that in December, 1790, the native Colbee told him that he (Colbee) had been present when Mr. White had cut off a woman's leg, and he depicted the agony and cries of the poor sufferer "in a most lively manner". At Rio de Janeiro, on the voyage out, White had prevailed on one of the Portuguese surgeons to let him amputate a leg "according to Allenson's method". During the progress of the operation the Portuguese with his pupils did not seem much pleased, but a very short space of time later made them of a different opinion, and the stump was nearly cicatrized in eighteen days. He states:

> Whenever I visited the hospital afterwards, the objects of pity with which it was filled, used to crowd around me in such a manner and in such numbers, for my advice, that I found it difficult to get past them. And now they would readily have submitted to any operation I should have proposed.

But he adds, tactfully:

> as I saw the surgeon did not much approve of my interference, I gave up all ideas of it.

John Hunter, F.R.S., and His Examination of the Kangaroo.

The great John Hunter, the most celebrated of all medical naturalists, has associations with Australia. Thomas Wilson, to whom John White transmitted his "Journal" and specimens, enlisted the help of various specialists in describing the animals and plants. The editor of the "Journal" thanked Dr. Shaw (who described the birds); Dr. Smith [Sir J. E. Smith], "the possessor of the celebrated Linnæean collection; and John Hunter, Esq., who, to a sublime and inventive genius, happily unites a disinterested and generous zeal for the promotion of natural science". Dr. Shaw superintended the publication of the zoological side of the natural history and, in introducing the portion contributed by Hunter, wrote:

> The Non-descript Animals of New South Wales occupied a great deal of Mr. White's attention, and he preserved several of them in spirits, which arrived in England in a very perfect state. There was no person to whom these could be given with so much propriety as Mr. Hunter, he perhaps being most capable of examining accurately their structure.

Hunter in his introduction lamented that, though a number of specimens had been received from New South Wales, very little information had accompanied them. Most required "further observations relative to their œconomy". Of the kangaroo,

> the only parts at first brought home were some skins and skulls; and I was favoured with one of the skulls from Sir Joseph Banks. As the teeth of such animals as are already known, in some degree point out their digestive organs, I was in hopes that I might have been able to form an opinion of the particular tribe of the animals already known, to which the kangaroo should belong; but the teeth did not accord with those of any one class of animals I was acquainted with, therefore I was obliged to wait with patience till I could get the whole.

Then follows, from White's specimens and perhaps from other sources ("in all of the young kangaroos yet brought home . . . they have all the marks of a fœtus") descriptions of the adult and young, the teeth, limbs and tail in considerable detail.

> The skin on the palm is different from that on the back of the hand and fingers. . . . The nails are sharp, fit for holding. The tail is long in the old; but not so long, in proportion to the size of the animals, in the young. It would seem to keep pace with the growth of the hind legs, which are the instruments of progressive motion in the animal; and which would also show that the tail is a kind of second instrument in this action. . . . It has two clavicles; but they are short, so that the shoulders are not thrown out.

These short extracts show admirably Hunter's accuracy in detail and the inferences that may legitimately be drawn from the observations made. He suggests that the tail is a second instrument in progression, not that it served the purpose of an extra limb. John White had discredited that idea and we now know that the tail (which the latter thought was used as a weapon) acts as a balance to the foreparts in hopping. Note also the inference from the size of the clavicles. In White's "Journal" the purely anatomical details are purposely left out, but a description of the viscera of the kangaroo, together with the portions printed in the "Journal", appears in Hunter's "Essays and Observations" (1861), Volume II, pages 252-254.

Robert Brown, F.R.S., and the Botany of Australia.

Robert Brown (1773-1858), who has been described by Humboldt as "*Botanicorum facile princeps*", studied medicine in Edinburgh, and in 1795 joined the army and went with the Fife Fencibles to Ireland as ensign and assistant surgeon. Through the influence of Sir Joseph Banks, he was appointed naturalist to the *Investigator* under Matthew Flinders in his famous voyage to *Terra Australis*. Some of Brown's botanical collections were described in his "*Prodromus Floræ Novæ Hollandiæ*", published in 1810. Of this work Sir Joseph Hooker wrote many years later:

> In point of novelty of plant forms and structures which it describes, accuracy in details, precision of language, wealth of observations, and far reaching views of classification, it maintains to this day the unique position which was assigned to it on its appearance.

Asa Gray ("Collected Works", Volume II, page 253, quoted by J. H. Maiden in "Sir Joseph Banks, The Father of Australia", 1909) said of him:

> . . . Perhaps no naturalist ever taught so much in writing so little, or made so few statements that had to be recalled, or even recast; and of no one can there be a stronger regret that he did not publish more.
>
> His work was at first that of a descriptive botanist, but this very soon brought him face to face with problems that involved the most difficult questions in the science. In the endeavour to determine the relations of the little-known and very peculiar Australian flora, he found it necessary to choose whether to accept the convenient artificial system of classification devised by Linnæus, and which held almost unquestioned sway in Britain, or to seek to discover the natural affinities of the plants, and to base the classification upon these. To those trained in methods and in the results of discoveries largely due to his genius it is scarcely possible to realise the difficulties that he had to overcome. He recognised that to ascertain relationships the structure and development of plants must be known to an extent very far beyond that yet reached. These researches demanded new methods, and the instruments alone available were very defective when compared with the necessaries of every laboratory of the present day. But Brown overcame all difficulties, and, with instruments such that we can but marvel at the work done with them, he opened up new lines of research in structure, in development, and in functions of plants, and threw light on many points that had been darkness before he touched them, while he showed the way for others to advance, and may be said to have given form to many parts of the science.

Perhaps the most important of his discoveries was that of the nucleus of the cell.

On Flinders's voyage, Robert Brown also collected zoological and geological specimens. Mount Brown in the Flinders Range near the head of Spencer Gulf was named after him.

Robert Brown was thus a medical man who practised his profession but little, passing over to the study of botany with outstanding success. The qualities mentioned by Sir Joseph Hooker as characterizing the "Prodromus" —accuracy in details, precision of language, wealth of observations and far-reaching views—epitomize the ideal of a scientific or medical publication.

Benjamin Bynoe of the "Beagle".

Benjamin Bynoe (1803?-1865) was surgeon on the *Beagle*, both during the time when Darwin was on board and later during the discoveries made round the coast of Australia by Captain Wickham and Captain Lort Stokes between 1837 and 1843. On December 7, 1839, at Point Pearce near the mouth of the Victoria River, and shortly before Stokes was speared in the chest by the natives, Bynoe shot "a new and very beautiful bird of the finch tribe, in which the brilliant colours of verdegris green, lilac purple, and bright yellow, were admirably blended". This was the famous Gouldian finch so common in our aviaries, and Bynoe's specimen was figured in Gould's "Birds of Australia". In the Abrolhos Islands he dissected two or three hundred wallabies, searching unsuccessfully for the presence of gestation, and only by a stroke of misfortune on the Victoria River missed finding the solution of the question of the birth of the kangaroo. He had shot a "flying doe" of more than ordinary size with enlarged mammary glands; the uterine cavity was thickly coated with a slimy secretion; between the womb and the posterior part of the mammæ he found a small gelatinous mass about twice the size of a pea; pulsation and motion were observed in it. He put the specimen in a wide-mouthed bottle with some spirits, but the seaman carrying it, in crossing a deep watercourse, broke the bottle and did not mention the misfortune till next day, when the specimen had become dried up.

Dr. George Bennett and Smallpox in the Natives.

Dr. George Bennett (1804-1893), perhaps our most distinguished medical naturalist, settled down in Sydney in 1835 to practise his profession, but as the "Australian Encyclopædia" says, "was never too engrossed in it to neglect the study of natural history".

Dr. R. Scot Skirving tells me that he knew George Bennett and realized that he was no ordinary man, a statement fully substantiated by an account of his many activities in Dr. Scot Skirving's possession, a family paper printed for private circulation. He was a Doctor of Medicine, a Fellow of the Royal College of Surgeons, a Fellow of the Linnean Society and a Fellow of the Zoological Society. He was the first to find the pearly nautilus alive, the preserved specimen being described by Professor Owen, to whom he also sent preparations illustrating the generation of the kangaroo and specimens of *Ornithorhynchus*. He discovered a new species of pine in New Zealand and published notes on the botany of this Dominion. To the Zoological Society of London he sent living specimens of the cassowary of New Britain, which is named after him, the kagu of New Caledonia (1862-1863), Eyton's tree duck from Australia (1867), and other birds and mammals. He was the first secretary of the Australian Museum committee from 1836 to 1841, and after the incorporation of the institution in 1853, a trustee till 1874. In 1871 he collected fossils for Sir Richard Owen. He was interested in acclimatization. He was a co-examiner in *materia medica* and therapeutics in the University of Sydney. The Clarke Memorial Medal of the Royal Society of New South Wales was awarded to him in 1890. He contributed a large number of papers to medical and scientific journals and proceedings. He published two important books, "Wanderings in New South Wales, Batavia, Pedir Coast, Singapore and China, Being the Journal of a Naturalist", two volumes (1834) and "Gatherings of a Naturalist in Australasia" (1860). Dr. W. H. Harvey, M.D., F.R.S., dedicated the second volume of his famous "*Phycologica Australica*, or History of Australian Seaweeds" to him in 1859. Besides the cassowary, another bird, *Ægotheles Bennettii* from Salvador and New Guinea, was named after him, as well as a tree kangaroo, a toad, a lizard, an insect, two molluscs, a fossil Diprotoden and a fossil lizard, five vascular plants and a seaweed. He bequeathed to the University of Sydney, Gould's ornithological works and a number of sets of scientific journals worth £2000. Dr. Scot Skirving saw him in consultation with Dr. W. Goode in William Street, Sydney, before he died in 1893, which brings us today in touch with a very remarkable medical man, naturalist and general citizen.

Bennett first visited Sydney in 1829 after a voyage of exploration in the *Sophia* to the Pacific. He returned in 1832, and in "Wanderings in New South Wales, Batavia . . . during 1832, 1833 and 1834" has given a vivid and interesting account of his travels over the Blue Mountains, along their western foothills and down to the Tumut and Upper Murrumbidgee districts. This work contains quite a number of items of medical interest. Chief amongst these is the account of an eruptive disease, almost certainly a form of smallpox, which appeared amongst the natives of Wellington Valley in 1830. The disease, he says, excited so much attention that the Government was induced to send a medical gentleman into the country to report upon its nature. Dr. Mair, assistant surgeon of the Thirty-ninth Regiment, was selected for this purpose. He gave Bennett a copy of his report, which the latter fortunately abstracted, as this seems the only record of its contents available. Miss Mander Jones, principal librarian of the Mitchell Library, has made inquiries for me and can find no trace of the report's having been printed, though this may have been done. The description of the course and forms of the outbreak is that of smallpox. General symptoms preceded the eruption, which was confluent in some cases. Pitting followed scabbing of the pustules. Some could not walk for a long time from tenderness of the feet due to the eruption on the plantar surfaces. Incidentally, it may be mentioned that the soles of the feet of natives in central Australia and probably throughout Australia are like thick rubber tires in consistence—it is curious to see one sitting down and digging out deeply penetrating prickles or splinters in much the same way as one digs out a nail embedded in a motor tire. Many natives died of the disease and some tribes seem to have been more than decimated by it. A few Europeans were attacked, one child dying from confluent smallpox. Dr. Mair refers to the occurrence of a disease amongst the natives round Sydney in 1789 that seems also to have been smallpox. Collins gives an account of it and says that "the people whose business called them down the harbour, daily reported that they found either in excavations of the rocks, or lying upon the beaches and points of different coves, the bodies of many of the wretched natives of the country". The origins of this outbreak and of the later one in 1830 could not be traced at the time, but in reviewing all the records of this disease amongst the natives some years ago, I came to the conclusion that smallpox had probably been introduced amongst the natives by Malay trepang fishers along our northern coastline and that on three separate occasions. The disease must have gradually travelled from tribe to tribe across Australia and in its progress had reached Port Jackson not very long after the arrival of the First Fleet. The 1830 epidemic was a second wave—we know that Major Mitchell saw pock-marked natives and met with decimated tribes on the Darling in 1835, and pitted individuals were seen near Adelaide in 1839, showing how far spread it was. There is some slight evidence of a still later outbreak. The heavy mortality amongst the aborigines indicates, I consider, that the disease was not alastrim, the mild form of smallpox that established itself for a while in New South Wales in 1913.

In the appendix to the second volume of Bennett's "Wanderings in New South Wales" is an interesting paper entitled "Remarks on the Morbid Appetite of Breeding Ewes, in several parts of the Colony of New South Wales, more particularly observed about the Murrumbidgee Country, occasioned by Eating Earth impregnated with some Alkaline Salts". In the affected districts, often limestone country, the breeding ewes devoured the progeny of other ewes at birth to such an extent that some holdings had to be given up. This perverted appetite was probably due to imbalance in the intake of calcium and phosphorus.

Bennett has some interesting remarks to make about the aborigines. He describes an old woman of a tribe on the Cudgegong who was in mourning. Her people were "well-formed, muscular, extremities well-proportioned, but of slender form; . . . . cheek-bones prominent, nose broad and flattened, with expansive nostrils, mouth large; beard

copious, and hair long, black and coarse". On the Yass Plains in November the cicadas (the *galang, galang* of the aborigines) were much in evidence. He says:

> My notice was particularly directed by the natives to the drums in the male insects, as the means by which they produce their thrilling sounds; at the same time adding, in their peculiar English, "Old Woman Galang, galang, no got, no make noise"; implying that the females do not possess these musical instruments.

Bennett's "Gatherings of a Naturalist" gives an excellent general account of the natural history of Australia and, though written nearly ninety years ago, is still of much interest.

John MacGillivray and Kennedy's Expedition.

John MacGillivray (1822-1867) commenced his medical studies in Edinburgh, but before completing the course was appointed in 1842 as assistant naturalist to Professor Jukes in H.M.S. *Fly* and in 1846 as naturalist to H.M.S. *Rattlesnake* under Captain Owen Stanley, with T. H. Huxley as medical officer. In his "Narrative of the Voyage of the Rattlesnake" are occasional references of medical interest. However, in the second volume he has included an account from survivors of E. B. Kennedy's disastrous exploring expedition of 1848 towards Cape York. In the narrative of William Carron, who was the botanist, a vivid description is given of the effects of starvation and of famine œdema. Thus on November 26 (page 215) is the entry:

> Carpenter died this morning; the poor fellow did not suffer acutely on the approach of death, but the animal energies were destroyed, and they withered away one after another, without pain or struggle.

On December 24 (page 220) Carron says that his legs had swelled very much and he was able to walk but a very short distance. On December 30, when rescued (page 225), he says that he was reduced almost to a skeleton.

> The elbow bone of my right arm was through the skin, as also the bone of my right hip. My legs also were swollen to an enormous size.

Dr. Vallack thus describes the rescue of the two survivors (page 250):

> On the other side of the hill, not two hundred yards from us . . . two of the most pitiable creatures imaginable were sitting down. One had sufficient strength to get up; the other appeared to be like a man in the very last stage of consumption. Alas! alas! they were the only two left of the eight, the remainder having died from starvation. . . . Carron's legs were dreadfully swollen, about three times their natural size, from œdema. . . . I was for some time afraid of Carron.

After the cruise of the *Rattlesnake*, MacGillivray returned to Sydney "to prosecute his favourite pursuit". There, on June 6, 1867, about 10 a.m., after a night with great difficulty in breathing, he was about to enter the coffee-room of the Kent Larder boarding house when he fell downwards and died before he could be removed to the infirmary. Mr. W. J. Mountain, house surgeon at the infirmary, made a post-mortem examination of the body and attributed death to the sudden loss of power in the heart, the result of old-standing disease. Dr. J. C. Cox, at the inquest, said he had known MacGillivray for the last six years and had recently employed him as a collector of natural history specimens. He had been suffering from cough, difficulty of breathing and general debility. He agreed with Dr. Mountain's opinion as to the cause of death, which with our present knowledge we would attribute to coronary disease.

The Bancrofts: Pituri, Filaria and Dengue.

The Bancroft family, now covering three generations of medical naturalists, have contributed notably to knowledge of value to our profession as well as to science in general. Joseph (1836-1894) was born near Manchester and arrived in Brisbane in 1864. On the voyage out he dissected flying fish. On arrival he became much interested in the pharmacological properties of some of the new plants around him. It was only three years earlier, in 1861, that disaster had overcome the Burke and Wills exploring expedition. Wills in his diary had referred to "some stuff" the natives called "bedgery or pedgery; it has a highly intoxicating effect when chewed, even in small quantities". King, the survivor, brought back some "pitcherry" with him, which in 1863 was presented to the Royal Society of Tasmania. These reports greatly interested Bancroft, and he attempted to obtain material for experimental purposes; this he received in 1872. An infusion injected into a cat and a puppy rapidly killed them. Smaller doses were employed on rats and frogs. He found that the poisonous substance caused preliminary excitement, followed by irregular muscular action, then respiratory paralysis and death. It was some time before the plant yielding the pituri could be identified, but eventually Baron von Mueller was able to show from material submitted through Bancroft that this was *Duboisia Hopwoodii*.

Von Mueller also suggested that the related corkwood, *Duboisia myoporoides*, much more accessible than pituri, might be worth investigating for any pharmacological properties. In 1877 Bancroft investigated the plant and made the highly important discovery that it produced wide dilatation of the pupils. During the last war the plant was extensively used as a source of atropine and hyoscine.

The discovery of the narcotic effects of pituri by the natives of south-west Queensland doubtless arose through trial of every possible plant as a source of nourishment during drought. Its sustaining effects during fatigue must have been noted. It was traded in exchange for red ochre from the Mulligan in south-west Queensland as far as Quorn in South Australia. In central Australia it was used as a poison for stupefying emus, its place for chewing by man being taken by several species of true *Nicotiana*, especially the tall handsome *Nicotiana excelsior*. Quids of the chewed material, mixed with the alkaline ashes of species of acacia, are parked behind the ear until again required by the owner or a friend.

Joseph Bancroft's other great discovery was the finding in 1876 of the adult filaria responsible for *Microfilaria nocturna*, found in the blood and chylous urine of patients in Brisbane. This Cobbold named *Filaria Bancrofti*, which is now transferred to the genus *Wuchereria*.

Joseph's son, Thomas Lane Bancroft, was born in Nottingham in 1860 and, of course, accompanied his parents when they came out in 1864. He was an outstanding naturalist and interested in many sides of zoology and botany, to which he made notable contributions. He extended Manson's discoveries on filarial worms and completed our knowledge of the development of *Filaria Bancrofti* in the mosquito and its method of inoculation into man. In January, 1906, he published his observations and experiments on dengue, which contributed so materially to the establishment of the vector of this disease in Australia. He noted that direct contact, such as sleeping with a patient, did not lead to infection. This suggested that an intermediate host played a part in transmission. As country people who had visited friends in dengue-stricken Brisbane by day only had developed dengue after their return, such an intermediate host could not be the purely night-biting and well-named mosquito *Culex fatigans*. On the other hand, *Stegomyia fasciata*, now known as *Aëdes calopus*, which bites by day in poorly lighted rooms and which was also prevalent, might be the culprit. He experimented with these latter mosquitoes, his patients developing dengue each in five days, one after the mosquito had been kept twelve days and the other ten days after feeding on the blood of a dengue patient.

In 1916 an epidemic of dengue swept through Queensland and into the northern coastal portion of New South Wales. As dengue infections had never occurred in Sydney, Dr. Burton Bradley and myself thought this would be an excellent opportunity to confirm T. L. Bancroft's experiments, which had been carried out in an area where possible natural infection could not be certainly excluded. So I set out by coastal steamer for Murwillumbah. On April 3, 4 and 5 I collected mosquitoes (*Aëdes calopus*) from the rooms of patients suffering from or recently

recovered from dengue. On the evening of April 5, just before going down to dinner, I discovered to my dismay when I looked at my mosquito cage that many of the now famished and consequently thin mosquitoes, no longer rotund with abdomens distended with blood, were making their way through the meshes of the gauze. To save any was a matter of minutes. There seemed no help for it but to insert my own arm and let the mosquitoes have a good meal. This they did with avidity and then could no longer escape. At that time experiments elsewhere had suggested that the incubation period of dengue was about three days. But I was more than three days from my home in Sydney. I had to go by steamer down the Tweed River, then by train to Brisbane, and then again by train by the old route to Sydney. On the way down, when

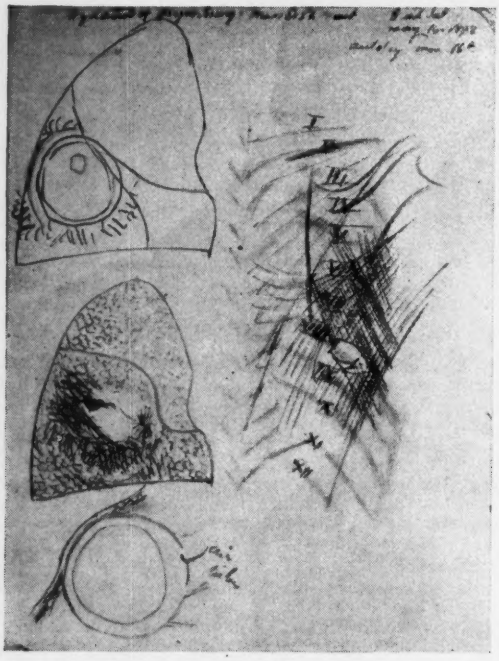

Figure IV.

Page from one of Professor Watson's notebooks, showing a hydatid cyst of the right lung. (By courtesy of Mr. H. Marston.)

the three days were over, I kept expecting an attack of "break-bone fever", but nothing happened. I arrived in perfect health. On April 12, however, seven days after the biting incident, I developed in my own home a typical attack of dengue. The mosquitoes I had cherished so much came to an untimely end. They were being taken round to bite volunteers by my colleague, whose rather ancient and rattling motor bicycle shook them to death. So his turn to go north followed. He collected *Aëdes calopus* at Mullumbimby and brought them safely to Sydney, and by their means successful transmission was effected in a dengue-free area. My own journey, however, was not fruitless. My blood was injected successfully into volunteers, mostly inmates of an old men's home, who received ten shillings (worth something in those days) if they "took", but only half-a-crown if nothing resulted. Those who got half-crowns were quite pleased, but the ten shilling people considered they had made a very poor bargain. Needless to say, dengue is a relatively mild though uncomfortable disease and never fatal, so that we and the volunteers ran no risk. Far otherwise is it with its relative yellow fever.

T. L. Bancroft was an energetic and discriminating collector of specimens of animals and plants, and very generously placed these at the disposal of various specialists. No less than eight species of Diptera (flies, sandflies and mosquitoes) and one genus of mosquitoes, two species of Nematodes and two of Cestodes, two of Trematodes, a leech, a trypanosome and a mistletoe were named in his honour.

Dr. Mabel Josephine Bancroft (now Mrs. Mackerras), representing the third generation, is a daughter of T. L. Bancroft, and both she and her husband, Dr. Ian Murray Mackerras, have made notable contributions to entomology and parasitology in Australia.

Sir Edward Stirling, F.R.S.: Boomerang Legs, the Marsupial Mole and Diprotodon Remains.

It is very appropriate that Sir Edward Charles Stirling (1848-1919) should be mentioned in this address, because he was not only a naturalist and medical man, but a colleague of Archibald Watson, and both he and the latter became very interested in that remarkable bony condition "boomerang legs" in the central Australian natives. This condition was first described by Stirling under "Notes from Central Australia" in the *Intercolonial Quarterly Journal of Medicine and Surgery*, Volume I, 1894-1895, page 221. Portion of his description is as follows:

> *Curvature of Tibiæ.*
>
> On the journey northwards of the Horn Expedition, I noticed a young native girl of about 15 years of age, whose tibiæ presented a conspicuous and symmetrical anterior curvature. This was associated with marked platycnemism, a condition in which the tibiæ are much flattened, as if by lateral compression. This girl was ill-nourished even to emaciation, but presented no other abnormalities either of bones or teeth so far as I could discover. Subsequently, when, in the neighbourhood of the Macdonell Ranges, we came into more frequent contact with the natives, I was surprised to find that a very large number of the blacks, both male and female, young and adult, presented the same peculiar tibial conformation, as the only observable abnormality, the platycnemism being also well marked. The latter peculiarity has received attention from an ethnological point of view, though it is not confined to the Australian aboriginals. It has also been noticed in the tibiæ of palæolithic man.

Stirling mentioned that the residents of Central Australia not inaptly spoke of natives so affected as "boomerang-legged". Dr. William Gardner, in the next volume of the *Intercolonial Quarterly Journal of Medicine and Surgery* (page 47), under the heading "Platycnesmism", mentioned that Professor Watson had long known of the existence of "boomerang legs" in Central Australia.

In an advanced case of this condition, the patient presents an amazing appearance when walking. During the first anthropological expedition of the University of Adelaide to Central Australia in 1927, we had the opportunity of seeing a patient with such an advanced lesion and procuring a cinema film of the patient walking. Her legs looked as though they were a pair of giant calipers with the curve forwards instead of laterally.

The ætiology of the condition is still disputed. Dr. C. Hackett, who has written a monograph on the subject ("Boomerang Legs", a special report issued by the Royal Society of Tropical Medicine and Hygiene) maintains that the condition is due to yaws and can be paralleled by this disease elsewhere than in Australia. He considers that the condition called "irkintja" in the interior of Australia is really yaws. My own opinion is that irkintja is not yaws but a third member of the syphilis-yaws group, which has become differentiated from yaws during the long isolation of our natives from the rest of mankind. It is to be noted that sometimes more than 50% of native children in the interior yield a positive Wassermann reaction, though nearly all of them seem free from obvious lesions.

As regards the flattening of the tibiæ and their curvature, I am inclined to think that a nutritional factor may come in and that the flattening of the bones may be in part due to the natives sitting on their infolded legs—such pressure on young bones slightly softened by some food or mineral deficiency might lead to flattening.

Sir Edward's career as a surgeon at the Adelaide Hospital, as a legislator for a brief period and as professor of physiology for many years in Adelaide cannot be dwelt on here. His zoological interests, however, led to his association with the South Australian Museum, of which he became the director. He gave the first description of the blind marsupial mole, which he called *Notoryctes typhlops*, and with Zietz described the remains of the Diprotodon and other species of extinct marsupials and birds which had been bogged in Lake Calabomna.

Sir Joseph Cooke Verco and Conchology.

Sir Joseph Verco is a very good example of a medical man who reached eminence in his profession and also contributed materially to our knowledge of one of the branches of natural history—conchology. A colleague of Archibald Watson, he, like the latter, published far too little of his medical experiences and views. Sir Joseph made full and careful notes on all his patients after a very methodical clinical examination. He was the first to describe an amœbic abscess of the liver contracted in Australia, and with Sir Edward Stirling wrote the account of hydatid disease in Clifford Allbutt's "System of Medicine". He became interested in shells and took up their study so thoroughly that he was one of the leading conchologists of his day in Australia. To acquire living specimens he undertook a number of dredging expeditions in South Australian waters, which not only enriched his collections but added a number of other species of marine animals to the collections in the South Australian Museum, some of which were new to science. When Sir Joseph was worried or felt tired, I can visualize him retiring to his room and examining and rearranging and describing the shells in his cabinets. Everyone should have a hobby, and most of all a medical man. If this hobby consists of the study of some branch of science, so much the better—it is recreation time put to good service in the advance of knowledge. A hobby or occupation of some sort is an absolute essential on retirement for the continuance of a healthy mental outlook. It is a therapeutic essential in geriatrics.

A. Jefferis Turner: Lead Poisoning and Moths.

Dr. A. Jefferis Turner, who died on December 29, 1947, was a lepidopterist of distinction and described with detail and great care a large number of moths (which he had mostly collected himself in various parts of Australia) in the proceedings of the Linnean Society of New South Wales and of the Royal Society of South Australia, and in other periodicals. In 1892 he described "A Form of Cerebral Disease Characterized by Definite Symptoms, Probably a Localized Basic Meningitis" in the *Transactions of the Third Intercolonial Medical Congress* (page 98). In 1897 he and the late Dr. John Lockhart Gibson were able to show that lead poisoning, later traced to ingestion of lead from the dried paint of veranda rails, was common in Queensland children, and this cerebral disease was saturnine encephalopathy. Here again observation and accurate recording hallmark the able naturalist and are equally valuable in the recognition of what is new, whether in diseases or in moths. Henry Burton's recognition in 1840 of the blue line near the edges of the gums in lead poisoning is another example of the value of careful observation, as this had escaped the notice of all those who had treated cases of Devonshire colic and other forms of lead poisoning up to that date.

Other Medical Naturalists.

Time will not permit me to do more than make reference to many other medical naturalists who have worked in or have been associated with Australia. These include Sir Joseph Dalton Hooker, who published his "Introductory Essay to the Flora of Tasmania" in 1859; Sir Richard Owen, to whom George Bennett sent specimens of the platypus and echidna and many fossils; Dr. James Cox (1833-1912), of Sydney, a distinguished conchologist, who was lecturer in medicine in Sydney when I was an undergraduate and whose house physician I was; my late colleague Dr. Eustace William Ferguson (1884-1927), who did so much to advance our knowledge of mosquitoes and biting flies and applied his results to medical problems; Dr. J. B. Harvey, C.M.Z.S., at Kangaroo Island and Port Lincoln from 1839 to 1843, who sent many specimens to the Zoological Society of London and to Gould; Dr. W. H. Harvey, F.R.S., the algologist who wrote "*Phycologica Australica*, or History of Australian Seaweeds"; Dr. Godfrey Howitt, who arrived in Melbourne in 1839 and was regarded as the foremost entomologist in Victoria for many years; "the turbulent Dr. Lhotzky" that Dr. John MacPherson wrote about in The Medical Journal of Australia in April, 1938; William Edward John Paradice (1897-1927), naval surgeon, already a naturalist of distinction when he was lost on the *Greycliffe* in Sydney Harbour; Dr. John Vaughan Thompson (1779-1847), Deputy Inspector-General of Hospitals in 1836, a distinguished zoologist.

Reference must also be made to the naturalist naval surgeons of the various French expeditions of discovery at the end of the eighteenth and first half of the nineteenth centuries who visited Australia.

Many of our medical men have been ornithologists. Notable amongst these were William Snowball, of Melbourne, who died in 1902 at the age of forty-seven years, and who had an oological collection of considerable value; Sir Charles Ryan (1853-1926), the surgeon of Plevna fame; Alexander Matheson Morgan (1867-1934), of Adelaide; William David Kerr MacGillivray (1867-1933), of Broken Hill, a good surgeon; Robert Henry Pulleine (1869-1935), of Adelaide, an excellent general field naturalist as well; Ernest Arthur D'Ombrain, of Sydney, who died in 1944 at the age of seventy-seven years; and Arthur Chenery (1869-1948), who worked particularly at Port Augusta and Wentworth.

But the medical naturalist is not extinct, as this *résumé* might at first suggest. Professor F. Wood Jones, F.R.S., during his stay in South Australia, published his "Mammals of South Australia" (1923-1925). Dr. Hugo Flecker, of Cairns, is doing remarkably good work on the natural history of North Queensland. Dr. C. Sutton, of Melbourne, has worked on the eucalypts and in field botany. W. L. Rait has written on the venation of the wing of the stone-fly.

During the second World War ample opportunities occurred for the application of natural history to the elucidation of medical problems, particularly in connexion with malaria and rickettsial diseases. The work of Dr. M. J. Mackerras on malaria was outstanding, and her husband, Dr. I. M. Mackerras, in addition to other researches, showed that the mosquito *Aëdes scutellaris* was responsible for jungle dengue in the archipelago of New Guinea. The recognition of "Q" fever and the working out of its ætiology and the study of other diseases in Queensland by Dr. E. H. Derrick and his associates have been contributions of note. Dr. C. E. M. Gunther and Dr. R. V. Southcott have added to our knowledge of the systematics of the mites, so important in the transmission of scrub typhus. All these observations and many others show that medical naturalists continue to contribute notably to the advance of knowledge and that there is still ample room for the useful application of observations of the kind recorded by the earlier doctors who were naturalists.

In an appendix to this paper I have given references to articles referring to various medical men, no longer living, who have contributed to our knowledge of natural history in Australia.

Part II. The Contributions of the Naturalist to Medical Knowledge in Australia.

Considerable work has been done in Australia on the natural history of such important diseases as plague, malaria, dengue and the scrub-typhus group. I have been fortunate in having been closely associated with such work in two of these diseases, so that I will dwell on them more fully than on the others.

Plague.

Plague reached Sydney early in 1900, the first cases being reported just as I took up residence as house surgeon

at the Prince Alfred Hospital. It was already known that the bubonic type was associated usually with an enzootic in rats and that rat fleas transmitted the infection. This opened up a wide field for investigation. What species of rats in Australia were infected? How intimate was their association with man? What kinds of fleas bit man? Which were likely to convey plague to man? It was soon found, as far as Australia was concerned, that two species of rats, *Mus rattus*, the old English black rat, and its Alexandrine variety, and *Mus norvegicus*, the sewer or Norway rat, together with *Mus musculus*, the common mouse, were closely associated with man and all could contract plague. The Norway rat is more thickset than the black rat, is mouse-coloured in the wild, has a tail which is shorter than the length of the body and head, has shorter ears, has a different arrangement in the sutures of the skull and other points of separation from the other species. The black rat is a more elegant creature, is of a beautiful blackish colour in the type, but in the variety may have a white belly and brownish back or be uniformly mouse-coloured, and has a tail which is longer than the body with the head. Their habits differ. The black rat is a climbing rat and the Alexandrine variety is often fruit-eating. The sewer rat, the alternative name for the Norway rat, indicates its preference. The black rat, from its climbing propensities, is more adventurous than the sewer rat. It is more likely, therefore, to reach new parts of the world by sea before the latter, though not always so. It is also likely to become more closely associated with man than the sewer rat, so that should it die from plague the fleas on leaving the cold body have a better opportunity of tasting man, and infecting him, than in the case of a dead sewer rat. In Sydney and Brisbane, where a number of plague cases occurred, both species of rats were met with. In the plague outbreak in Perth in 1906, we found that the Alexandrine rats were widely distributed, but the sewer rats came mostly from near the wharves, suggesting that they were a more recent introduction. In Adelaide it is doubtful whether any indigenous cases of plague occurred before 1909, and there is a general impression that at that time the common rat was the sewer rat and that the Alexandrine rat appeared only some years later. I myself remember seeing and shooting rats in African boxthorn (*Lycium*) hedges in the '90's; such habits were those of the Alexandrine rats, but the rats themselves were all greyish-brown like sewer rats. The sewer rat is a fiercer creature than its relative and decimated the old English black rats when it was introduced into Britain.

It is tempting to suggest that the escape of Adelaide from plague was due to its rat population, being sewer rats, attacking and destroying any plague-infested black rats trying to land from ships at Port Adelaide. If they did do this, the likelihood of the introduction of plague would be reduced though not abolished, as plague fleas leaving the infected rats would naturally attach themselves to the sewer rats and infect them. The practical escape of Melbourne from plague may own a similar explanation, or both may have escaped by mere chance.

As bubonic plague is usually conveyed in Australia from rats to man by fleas, it was necessary in Sydney to study fully the natural history of these insects during the years when plague was present or its reappearance threatened —that is, from 1900 till some years after the last outbreak in 1922. Thus, for instance, in 1910 and 1911 respectively, 22,821 and 22,774 rodents (a few mice, but nearly all the two species mentioned) were examined for plague. Five species of fleas were found on them, namely, *Læmopsylla* (now *Xenopsylla*) *cheopis* 701 in 1910 and 1105 in 1911, the blind flea *Ctenopsylla* (now *Leptopsylla*) *musculi* 541 and 1065, *Ceratophyllus fasciatus* (now *Nosopsylla fasciata*), which rarely bites man, 266 and 375, the dog and cat fleas *Ctenocephalus canis* and *felis* 8 and 11, and the human flea *Pulex irritans* 1 and 1. Of these fleas, *Xenopsylla cheopis* is sometimes spoken of as being the plague flea, because of its frequency in some places during a visitation of plague and the fact that, having left the carcass of a plague rat when the circulation has ceased, it eagerly seeks a fresh source of food and, in the absence of other rodents, may attack man. If it has been ingesting rat's blood containing plague bacilli, these may have had time to multiply and form a plug of these organisms in the proventriculus of the flea, preventing fresh blood entering the stomach. The famished insect bites again and again, the newly ingested blood regurgitating back into the puncture, charged now with plague bacilli. Thus new infections are established. In Sydney we tried guinea-pigs in cages on a few occasions as plague barometers. They were placed just outside the known area of plague infection. It was hoped that, if infected rats reached the warehouse in which they were placed and the local rats left when their fellows began to die, the fleas from the dead rats would soon settle on the guinea-pigs and infect them and so reveal the extension of the disease. As medical students tend to lap up as gospel all that their instructors tell them, jokes included, I have been quite prepapred for the statement that a good prophylactic device, if you have to visit plague premises, is to wear bell-bottomed trousers and place a guinea-pig in the hem in each leg; fleas from the rats will attach themselves to the guinea-pigs in preference to yourself, and when you

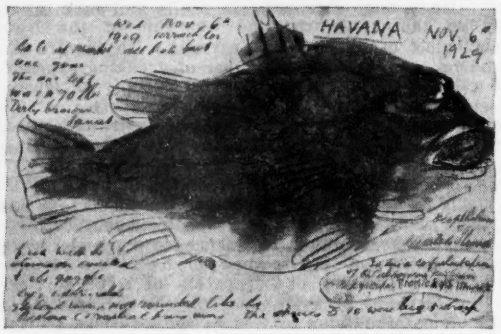

Figure V.

Page from one of Professor Watson's notebooks showing a sketch of a large fish in the market at Havana in 1929. (By courtesy of Mr. H. Marston.)

find that the guinea-pig is no longer running round the bottoms of the trouser legs, you get out of this garment as quickly as you can. The blind flea practically never bites man and *Nosopsylla fasciata* rarely. It will be seen that the cat and dog and human fleas are only occasionally found on rats. This is fortunate, as both attack man voraciously. Most of the flea plagues or infestations that one hears of in Australia are due to dog or cat fleas.

In several parts of the world, plague has been introduced by the ordinary travelling rats and from them has been conveyed by their fleas to local rodents and other animals. During the plague in Sydney a few cats and even marsupials in the Zoological Gardens, then at Moore Park, were attacked. Elsewhere, as in South Africa, Siberia and California, epizootics of plague have appeared in other rodents in the field, and these have left a reservoir of infection hard to control and liable to pass back to rodents in contact with man. A necessary condition for the maintenance of such an epizootic amongst animals in the field is that they have a flea population to spread the infection. Reviewing the situation in Australia, we may notice with alarm the wide distribution of a rodent, the rabbit, but that alarm is somewhat allayed when one knows the nature of their flea infestation. The dog and cat fleas are only found occasionally on them, but the Australian stickfast flea *Echidnophaga myrmecobii* may be numerous, and *Echidnophaga gallinacea* (the poultry flea) and *Echidnophaga perilis* also occur. The first-named of these stickfast fleas can transmit from one rabbit to another the virus of infectious myxomatosis, which it was hoped might exterminate the rabbit when introduced artificially it did not do so. The tendency of these fleas to attach themselves for long periods to the host would not lead

to rapid spread of the plague bacillus. Moreover, the rabbit is said to be less susceptible to plague than rats and guinea-pigs.

Thus the study of plague and its distribution offers the naturalist many lines of inquiry of absorbing interest and of practical importance.

The Mouse Visitation of 1917.

In 1917 a plague of mice of phenomenal proportions appeared in country towns in New South Wales, Victoria and South Australia. They particularly infested the stored wheat at country railway stations. As many as 500,000 mice, approximately eight tons in weight, were caught at one place in a night. The fungoid skin disease favous occurs from time to time in mice in Australia. The heads of the mice become covered with yellow crusts, the favus cups, which to the lay mind give the impression that much of the head has been destroyed. This condition is transferable to man. There were various reports at the time of an increase in cases of ringworm in man in the infested areas, but investigation did not substantiate the suggestion that many, or perhaps any, had been contracted from mice. A rather curious side issue of the mice plague occurred in the case of the death of a man from anthrax.

A lumper engaged in transferring re-bagged wheat at Darling Harbour developed a malignant pustule. The diagnosis had been established bacteriologically, and I was called to give evidence for the Crown when the widow sued the Government for compensation. As the lesion was on the neck in the shaving area, I gave it as my opinion that the infection had probably been derived from a Japanese shaving brush, a source of infection that had just about that time been demonstrated. The widow's counsel, however, suggested that the following was more likely to have been the origin of the infection. A sheep had died from anthrax in the open. Mice had attacked the carcass and ingested anthrax spores. The mice had later migrated to a wheat stack and there infected others. The dead mice had disintegrated and anthrax spores had spread amongst the wheat. This wheat had been bagged. The dust accompanying it and containing anthrax spores had worked its way through the bag to the outside. A prickle from a thistle caught in the meshes of the bag had caused a small wound in the neck as the bag was slung across and at the same time introduced anthrax spores which caused the malignant pustule. To my annoyance the judge scouted my suggestion and seemed to think that it was special pleading on my part on behalf of my employer, the Government, and the widow got the compensation to which I am reasonably sure she was not entitled.

Dengue, Malaria, Scrub Typhus and "Q" Fever.

Part of the natural history of dengue has already been given in the discussion of the work of Dr. T. L. Bancroft. Space does not permit of elaborating this or of giving an account of the notable additions to the natural history of malaria, of the typhus group of diseases and "Q" fever, and of other subtropical infections made during the war or just before it, and so ably contributed by the various workers in Queensland and New Guinea already mentioned.

Antibiotics in Australian Plants and Fungi.

Sir Alexander Fleming in 1929 noticed on a bacterial plate that "around a large colony of a contaminating mould the *Staphylococcus* colonies became transparent and were obviously undergoing lysis". Others doubtless can recall seeing similar appearances. Fleming, however, went further, and not only did he observe, but the observation left a definite mental impression. He doubtless said to himself "Why did this occur?" and later discovered that it was due to what we now call an antibiotic substance. He gave the name penicillin to filtrates of broth cultures of the mould. In 1940 Sir Howard Florey and his co-workers first described the work they had done on "penicillin as a chemotherapeutic agent", thus inaugurating a new era in the treatment of infections. Their work led to investigations on many other fungi and on extracts of higher plants to see whether other antibiotic substances, acting perhaps on different pathogenic organisms, might be obtained. In South Australia, Miss Nancy Atkinson soon became interested in the subject and was stimulated by a conversation with Sir Howard Florey in 1944 to investigate native South Australian vascular plants and higher fungi, such as the toadstools, for antibiotic properties. As a hobby of mine was collecting plants and studying the toadstools and mushrooms, she enlisted my services as a field naturalist. Many of the available native flowering plants were examined and it was found that an extract of the fruits of one of the Proteaceæ, the geebung, *Persoonia juniperina*, exerted an antibiotic effect on typhoid bacilli, staphylococci and the acid-fast *Mycobacterium phlei*. Crude oil from the flowers of the Geraldton wax plant (*Chamælaucium uncinatum*) was also found to possess antibiotic properties. The testing of the mushrooms and toadstools also led to interesting results. At the very beginning of these experiments an acquaintance brought in to me some mushrooms showing a yellow stain when bruised, to know whether they were edible. I said that I had eaten them without any untoward results, but that I thought some people might be upset by them. Fortunately, I handed them over to Miss Atkinson to test, and she found that there was an antibiotic, possibly more than one, which also interfered with the growth of acid fast bacilli, as well as the coccii and typhoid bacilli. From an appeal through the Press, people sent in large quantities of these yellow-stained mushrooms, and Miss Atkinson and her colleagues have been engaged for some while in purifying the antibiotic in the extract and in testing it. She has been able to grow the mycelium in the laboratory and so get a larger supply of material. A survey of several hundred other species of toadstools has resulted in the finding of antibiotic qualities affecting the same groups of organisms in two or three species of brown-spored fungi, namely, *Cortinarius austroevernius* and *Cortinarius rotundisporus*.

The Anthropology of the Australian Aboriginal.

The central Australian native still living under natural conditions is a delight to the medical naturalist. A nomadic hunter and collector of food, without any clothing whatsoever, traversing long stretches of waterless country, knowing of necessity all the natural history of his surroundings that has any bearing on his existence, the discoverer of indigenous narcotics in the shape of tobbacos (*Nicotiana* species) and pituri (*Duboisia Hopwoodii*), able to keep himself warm lying naked beside little fires on bitterly cold winter nights, his ecology is fascinating. The almost complete absence of caries and the grinding down by attrition of teeth admirably set in perfect dental arches give clues to the control of teeth decay in sophisticated races. Considerable attention has been paid already by medical men to our natives, and particularly by Sir Edward Stirling, of Adelaide, Dr. W. E. Roth, in Queensland, and Professor F. Wood Jones. The anthropological expeditions organized by the Board for Anthropological Research of the University of Adelaide and the South Australian Museum have also contributed a great deal to our knowledge of the natives of central Australia. Much more, however, remains to be done, and the time is short before the total disappearance of the unsophisticated native.

Part III. The Naturalist as Pathologist and Clinician.

I have already stated that I look upon the ideal naturalist as an observer and recorder of the living entities around him and of their surroundings, and as an interpreter as far as possible of the significance of what is observed. He not only studies the outward forms of the animals or plants or rocks in which he is interested, but he wants to know their inward structure as well. More than these, he wants also to know in the case of living entities as much as possible of their behaviour and functions and the whole of their ecology. I do not mean by this that every naturalist will be equally interested in all living creatures. Opportunity and training will direct him into this or that channel. He is apt to become so absorbed in the pursuit of knowledge in one particular direction that he may fail to see objects and events of great interest in some other field. The entomologist will notice insects

perfectly camouflaged to the botanist; the mycologist will reveal to his companion the extraordinary beauty of colour and delicacy of outline of many of the toadstools that the latter was about to crush with his feet; the ornithologist will find the nests of birds seemingly by intuition; and so on. I would like to emphasize, however, that this type of mind, given the necessary training and experience, may be able to apply itself with considerable success to almost any of these lines of investigation.

Now reactions to injury and disease are as much part of the natural history of animals and plants as their normal structure and functions. Moreover, infective diseases and parasites are of much importance in the ecology of their hosts. The inquiry here becomes broadened by the necessary consideration of the natural history of the living agents of disease as well as that of their hosts. How important such inquiries may be is well illustrated in the study of plague, malaria, yellow fever, trypanosomiasis, the typhus group of fevers, hydatid disease and many others.

From this it is quite obvious that the naturalist's type of mind is likely to be keenly attracted by the manifestations of disease in man, in other animals and in plants. He is likely to be very interested in noting how his subject reacts in the presence of disease and should the opportunity present itself what alterations in structure are revealed at an examination after death. I am sure that such great naturalists as John Hunter and Edward Jenner were as interested in their patients from this point of view as they were in the many other inquiries suggested by their fertile minds. In more recent times Sir John Bland Sutton, Sir Jonathan Hutchinson and Dr. F. Parkes Weber have shown us the great importance of careful scrutiny and intelligent observation of our patients. No better example could be given than the recognition of Hutchinsonian teeth in congenital syphilis. General observation often tells us much about the people we meet. With our medical training as a background we can interpret much more than the laity. Myxœdema, *paralysis agitans* and many other pathological conditions can be provisionally diagnosed by the appearance or behaviour of the individual. The late Dr. Robert Pulleine, a naturalist of merit, when a student fifty years ago in Sydney, gained considerable kudos for suspecting tuberculous leprosy in an out-patient in a country where lepers are very rare. As a young resident medical officer at the then Prince Alfred Hospital in Sydney, and full of the dignity of my position, I was just about to reprimand a child that came in, during the drafting of out-patients, for an unseemly entrance, when the smirk on his face was noticed to be fixed—it was really the sardonic grin of tetanus. On two occasions over the last quarter of a century patients with malignant pustule have died in the (Royal) Adelaide Hospital without this dangerous condition's being diagnosed in life. They came to post-mortem examination, and it was only when the very considerable œdema of the tissues of the front of the chest was appreciated that the real nature of the condition was suspected and anthrax bacilli were looked for and speedily found, both patients having the lesion on the neck. It was Jonathan Hutchinson's illustration in his "Archives of Surgery" of an iodide rash that led to the final recognition of an angry lesion on the face of an elderly woman as being probably due to this drug—and it was found on inquiry that she had been taking a proprietary medicine known to contain potassium iodide for rheumatic pains. The primary lesion of chickenpox in the case of a grandmother was quite naturally missed until the ordinary eruption appeared a few days later; the lesion on the cheek had caused alarm from its developing a vesiculo-pustular appearance with darker centre, suggesting *cancrum oris*, though the patient was not particularly ill. Such examples can be multiplied indefinitely by each one of us. The more experience we have, and the more diversified that experience, the more likely are we to seize the significance of what presents itself.

Here may I make a plea for much more recording of the unusual—even though the unusual to us may be a commonplace to others? I always find it most interesting to take up Sir Jonathan Hutchinson's "Archives of Surgery" or John Hunter's "Essays and Observations" and read about the cases reported or notes recorded in these volumes. The former, in 1890, published the first recorded case of temporal arteritis and, as the writer of a leading article in a recent *British Medical Journal* points out, it was forty years before a similar case was described and lately this condition has received considerable prominence. I am sure that a great deal of valuable information is being lost in our hospitals and pathology departments through the failure to record observations that are made.

Having the naturalist's type of mind, I became early attracted to pathology and particularly to the post-mortem side of it. As one sees here the end results of Nature's experiments (or should we say experiences?) in what one finds at the autopsy table, it is often possible to say what the course of the patient's illness was like and what symptoms and signs should have been shown. Nearly every such examination produces something of interest, and at times the finds are exciting and even spectacular. Time and again one sees lesions or combinations of lesions that the human eye has perhaps never observed previously, or at least observed with intelligence. Occasionally, medico-legal cases present themselves unexpectedly, but these are more likely to be in accidental deaths than in the subjects of murder.

On one occasion in a patient in a mental hospital the pericardial cavity was found full of blood. Such a condition is not uncommon in dissecting aneurysm and coronary infarction. In this case there was a little snick in the ascending aorta. A small wound was now noticed opposite to this in the parietal pericardium. It was next found that there was a penetrating wound through the sternum. The patient had been stabbed by a needle-like implement. It was found that a mattress needle fitted fairly accurately the puncture in the bone. Exactly what had happened was never known. The man had been sleeping with several others in a small ward. Whether he had stabbed himself or been stabbed by another was uncertain. It is possible that it was done during the day-time and that only when he lay down to sleep at night did the little puncture in the aorta gape and blood escape.

This seeing of the end results of disease and working backwards to the patient's symptoms in life has perhaps developed in me the pernicious habit of starting a detective story or even an ordinary novel and then looking at the end to see how the theme has been developed.

Circumstances have led to my having had the opportunity of performing a considerable number of post-mortem examinations, not only on ordinary hospital and mental hospital patients but also on infants and for the coroner. Early in the course of these the results were tabulated, and this tabulation now covers about 8000 cases. All the important lesions are mentioned in the summary, in order of importance or in order of sequence, and then a copy of the summary is pasted on cards under each pathological condition. Fortunately we have been able to have the results at the Royal Adelaide Hospital printed in the *Medical and Scientific Archives of the Royal Adelaide Hospital*, dealing with them a thousand at a time. As this information is printed it is available to anyone else to use and in years to come should be a valuable source of information as to the incidence of disease in Australia during the last thirty years. I hope in the course of time to make ample use of some of the material in it.

As an example of the contents of these *Archives*, I am throwing on the screen portion of the cases under the heading of "Hydatid Cysts" tabulated for the fifth thousand post-mortem examinations. An additional reason for my choosing echinococcal disease is that natural history plays an important role in the understanding of its means of spread.

There were 14 examples of these, or 1·4%, and in the sixth thousand 13. In two of the former series and in one of the latter, death was due to the hydatid cysts. In several of the other cases the hydatid cysts were old and had become calcified. An interesting condition, which I believe has not been mentioned in the literature of hydatid disease, is atrophy of one lobe of the liver and compensatory hyper-

trophy of the other when the cyst, usually found in a calcified state, has been situated at or near the junction of the right and left lobes. The atrophy may affect either of these main lobes. In one instance, in a man aged forty-four years, who died from aortic disease, the right lobe of the liver measured only three by three inches (7·5 by 7·5 centimetres), but this loss was made up by much hypertrophy of the quadrate and left lobes, so that the nutmeg liver that was present weighed sixty-eight and three-quarter ounces (1951 grammes), a normal liver weighing about fifty ounces (1418 grammes). With the exception of four, all the patients were over the age of fifty years, and it is probable that many had contracted the infestation when quite young. Ten of the 27 cases were in women, a fact suggesting that the eggs of the hydatid worm were as likely to be ingested in and around the house as in the open fields. After all, this is just what one would expect. It is, of course, a public health disgrace to have hydatid cysts in man or his domestic animals. It means that dogs have been allowed access to the unboiled livers or lungs of sheep or cattle harbouring hydatid cysts. This carelessness often occurs on sheep stations, but some butchers are equally ignorant. The minute tapeworms that develop in the dog as a result of ingesting the scolices discharge ova, which are passed by the dog. Common observation shows that dogs choose tufts of grass, if available, on which to deposit their droppings. This facilitates infection of sheep and cattle. Domestic dogs that feed on uncooked offal are often tied up at times near a kennel. Ova-containing fæces are passed and are soon dried and pulverized. The dog lies in this dust. Later you pat him on the head or sides, hydatid ova get on your fingers, and these soon contaminate food.

This example of our tabulations will show how quickly much information can be furnished. The numbers under each heading have only to be divided by ten to give percentages, and the sex and ages are given. We can tell you in a minute or so how many cases of meningitis or of duodenal ulcers or of any other lesion we have had in a thousand autopsies. A study of these records may also possibly reveal unexpected associations between pathological lesions. It is interesting to speculate whether Kinnier Wilson's hepato-lenticular degeneration would have been recognized by such a study, had it not been known.

The Naturalist and Veterinary Pathology.

Veterinary pathology appeals as much to the naturalist type of mind as human pathology. The study of disease in animals has helped materially in the elucidation of the nature of human diseases. This association has been greatly strengthened during the last few years. The formation of a section of comparative medicine by the Royal Society of Medicine has been an important contributing factor. In a recent number of its *Proceedings* (Volume XLII, April, 1949, page 201) appears a discussion on "Liver Damage of Metabolic Origin", and one of the contributors (J. D. Steele) gives a summary of recent work in Australia on three diseases of animals. These were of particular interest to me inasmuch as, before and during the first World War, I had met with two of these conditions, both in sheep, and had to some extent studied their pathology. The first condition Steele describes is facial eczema in animals. In western New South Wales I made several investigations, in collaboration with the Stock Department, on a form of dermatitis round the muzzles, nostrils and eyes of sheep. These parts became swollen and crusted, and the swelling led to interference with breathing. The reaction occurred only in parts where the wool was scanty or absent and the skin was unpigmented. Black sheep were not affected. The condition was attributed at that time to the eating of clover infested with aphides when it had grown up lushly after the rains. Cattle were also affected if they had white blazes with unpigmented skin. This photosensitization has now been traced to ingestion of phyllærythrin. The other disease examined was enzootic jaundice of sheep. This condition occurred in a flock of sheep near Narrabri, particularly in ewes bearing twins, that I was asked to see. The exact cause of this condition still seems in doubt, as its dependence upon a rise in the amount of copper in the blood does not seem to be a full explanation.

A considerable advance in the study of pathology was made when Bennett and his co-workers in Western Australia showed that profound changes could occur in ewes and wethers when the sheep had been fed to a large extent on one variety of subterranean clover. This food was found to supply an œstrogen-like substance; it was capable of acting like a hormone and was responsible for considerable hyperplasia of the prostate in wethers. If such pathological changes can occur in an animal from the ingestion of a substance in the food, it is quite possible that the intake of other substances in the food may be responsible for pathological conditions in man. The great increase in enlargement of the prostate may possibly be due to something that is now taken in our food which exercises a hormone-like effect on certain organs. It is also possible that some forms of malignant growths may eventually be traced to excessive intake of some substances associated with food.

Worm nodules are common in the briskets of cattle in various parts of Australia. Though not in any way dangerous to health, their presence is obnoxious to the fastidious. They have been the cause of considerable economic loss. Dr. John Gibson, of Windsor, New South Wales, accurately described them before the Intercolonial Medical Congress in 1892, and Professor T. Harvey Johnston and myself in 1910 called the worm *Filaria* (now *Onchocerca*) *gibsoni* after him. The worm or worms are nearly a yard long, but more slender than a thraed, and lie in a closely-coiled tunnel in the midst of dense fibrous tissue, this producing a nodule. The worm unquestionably undergoes a stage of development in some intermediate host, but all our attempts in New South Wales to discover what this was during the first World War were unavailing, and no one has been successful since. This search gives ample scope for the naturalist, as he has to consider the presence and habits of mosquitoes, sandflies, March flies, lice, ticks and leeches in the course of the quest. By analogy elsewhere, a Simulium (sandfly) is the most likely agent, but some natural infestations seem to occur where these biting-flies are rare or absent.

Conclusion.

In concluding this survey of the association between natural history and the medical profession, I trust that I have interested you and have shown what a wide field can be covered under the term "natural history". I sometimes wonder whether I am myself more a naturalist or more a medical man, but I have come to the conclusion that the two interdigitate to such an extent in my work as a pathologist that they cannot be separated, and I feel that there must be many clinicians who are in a similar position. At one time I thought that the naturalist type of mind was of common occurrence and was manifested early in life and was perhaps rather primitive. I am inclined now to think that the engineering brain is more common and that perhaps many children have no particular urge in any direction. I would like to say, however, that when the instincts of a naturalist are met with in a child, they are a treasure to him and an asset to the community and should be encouraged in every possible way. I am sure these people will make able medical men, if they choose that profession, and in the busy life of a clinician they will find the hobby of natural history a real recreation for them.

Finally, may I make a plea for the recording, it may be only as short notes, of any interesting clinical and pathological data that are met with? The waste of such in our hospitals and laboratories and private practice is appalling. Important advances in our knowledge of disease, its incidence and its treatment, may result from such contributions. It is essential, of course, that rubbish should be eliminated, and it is also very necessary that the title should be carefully selected for the purpose of indexing—how much useful material has been lost under such headings as "An Obscure Case" or "Case for Diagnosis"?

I cannot do better than end with these lines of Longfellow on "The Fiftieth Birthday of Agassiz":

> And Nature, the old nurse, took
> The child upon her knee,
> Saying: "Here is a story-book
> Thy Father has written for thee."
>
> "Come, wander with me", she said,
> "Into regions yet untrod;
> And read what is still unread,
> In the manuscript of God."
>
> . . . . .
>
> And whenever the way seemed long,
> Or his heart began to fail,
> She would sing a more wonderful song,
> Or tell a more marvellous tale.

APPENDIX: SOME REFERENCES TO MEDICAL NATURALISTS IN AUSTRALIA.

William Anderson (?-1778), master surgeon in the Royal Navy, who sailed with Captain Cook on his Third Voyage in the *Resolution* (1776-1779), was a naturalist and ornithologist. He died of consumption at the age of thirty years. (J. J. Keevil, *Annals of Medical History*, Volume V, Number 6, November, 1933. J. H. Maiden, *Proceedings of the Royal Society of New South Wales*, Volume LV, 1921, page 150. Tom Iredale, *The Emu*, Volume XXXVIII, July, 1938, page 60.)

Dr. Joseph Arnold (1782-1818), assistant surgeon on the *Victory*, surgeon on the *Hindostan*, a naturalist, visited Sydney in 1809. (G. P. Whitley, *Royal Australian Historical Society, Journal and Proceedings*, Volume XIX, 1933, page 303—contains extracts from his diary in the Mitchell Library, Sydney.)

R. A. Bankier, naval surgeon, collected specimens for Gould. He described the sacred kingfisher and obtained *Cacatua sanguinea* at Port Essington. He was also at Hong Kong. (Gould, "Handbook of the Birds of Australia", 1865, Volume II, page 7. G. P. Whitley, *The Emu*, Volume XXXVIII, October, 1938, page 153.)

Hans Hermann Behr (1818-1904) was in Adelaide from 1844 to 1847. He collected plants and wrote several papers on the insect fauna of South Australia. (A Musgrave, *The Australian Zoologist*, Volume VI, 1929-1931, page 198.)

William Edward Blackall, of Perth, who died in October, 1941, was in the Mental Hospitals Department and later in private practice. He was an extensive collector of Western Australian plants. C. A. Gardner named the genus *Blackallia* (Rhamnaceæ) after him. (*Journal of the Royal Society of Western Australia*, Volume XXVII, 1940-1941, page 183.)

Benjamin Bynoe (1803?-1865), surgeon on the *Beagle*, under Captains Wickham and J. Lort Stokes. (Numerous references in Stokes's "Discoveries in Australia", 1846; see particularly Volume II, pages 107 and 157. J. H. Maiden, *Journal of Western Australian Natural History Society*, Volume VI, 1909-1910 (details of Bynoe's service *et cetera*). Daley, *Victorian Naturalist*, Volume XLIV, 1927, page 187. Whitley, *The Emu*, Volume XXXVIII, October, 1933, page 153. *Nature*, May 5, 1934, page 697. *Proceedings of the Royal Geographical Society of Australia, South Australian Branch*, Volume XLV, December, 1944, page 41; mentioned several times in Benjamin Francis Helpman's "Journal".)

Alfred T. Corrie, surgeon on H.M.S. *Pearl*, visited Lord Howe Island in 1876 and gave an account of it. (*Proceedings of the Royal Geographical Society of London*, Volume XXII, pages 136-143; quoted by R. H. Rabone, *Royal Australian Historical Society, Journal and Proceedings*, Volume XXVI, Part II, 1940, page 148.)

The Honourable W. L. Crowther, F.R.C.S., C.M.Z.S. (See W. E. L. H. Crowther: "A Surgeon as Whaleship Owner", THE MEDICAL JOURNAL OF AUSTRALIA, Volume I, 1943, page 549; also "A Naturalist's Voyage from Van Diemen's Land to England, 1839", *St. Thomas's Hospital Gazette*, 1939.)

Dr. J. R. Elsey, surgeon and naturalist to A. G. Gregory's Exploring Expedition of 1855-1856, collected insects. Gray named a genus of tortoises Elseya after him in 1867.

James Benjamin Harvey, M.R.C.S., arrived in South Australia in November, 1838, and was stationed at Kangaroo Island and later Port Lincoln. He died at the latter place in 1843. A manuscript article on him as a naturalist by J. D. Somerville is in the Archives Department of the Public Library at Adelaide.

William Henry Harvey, M.D., F.R.S., the famous algologist, author of "*Phycologica Australica* or History of Australian Seaweeds", was in Sydney in 1855. (J. J. Fletcher, *Proceedings of the Linnean Society of New South Wales*, Volume XLV, 1920, page 616.)

Sir Joseph Dalton Hooker (1817-1911), P.R.S., assistant surgeon and botanist on the *Erebus*, collected extensively in Tasmania in 1840 and 1841, and in 1859 published the results of his researches under the title "On the Flora of Australia: Its Origin, Affinities and Distribution, Being an Introductory Essay to the Flora of Tasmania". He visited Sydney in 1841. (Extracts from his Sydney visit are given by J. J. Fletcher, *Proceedings of the Linnean Society of New South Wales*, Volume XLV, 1920, page 588.)

W. Edmund Charles Hobson (1814-1848) was born at Parramatta. He was one of the founders of the Tasmanian Society, now the Royal Society of Tasmania. He was the first Australian ichthyologist and wrote papers on the elephant shark, ornithorhynchus and fossils. (G. P. Whitley, *Royal Australian Historical Society, Journal and Proceedings*, Volume XIX, 1934, page 306; contains other references to him.)

Dr. James accompanied William Macleay as surgeon and collector on his trip to Somerset and New Guinea on the *Chevert* in 1875. (J. J. Fletcher, *Proceedings of the Linnean Society of New South Wales*, Volume LIV, Number 223, 1929, page 246.)

René Primevère Lesson (1794-1849), naval surgeon and naturalist, Corresponding Member of the Institute of France, and Prosper Garnot, surgeon and naturalist, were on the French vessel *La Coquille*, under Captain Louis Isidore Duperry, when she visited Sydney from January 17 to March 20, 1824. (Arthur Jose, *Royal Australian Historical Society, Journal and Proceedings*, Volume X, 1924, page 215. G. P. Whitley, *Royal Australian Historical Society, Journal and Proceedings*, Volume XIX, page 213. A. Musgrave, *The Australian Zoologist*, Volume VI, August, 1930, page 194.)

Dr. John Lhotzky, a scientist of note, doctor of medicine, Fellow of the Royal Botanical Society of Bavaria, born in Galian, was for four years in Sydney and more than a year in Tasmania in the 1830's. (J. V. Danes, *Royal Australian Historical Society, Journal and Proceedings*, Volume VIII, Part IV, 1922, page 212. Tom Iredale, *The Australian Zoologist*, Volume III, Part 6, 1924, page 223. G. P. Whitley, *Royal Australian Historical Society, Journal and Proceedings*, Volume XIX, Part V, 1933, page 319. J. MacPherson, "The Turbulent Dr. Lhotzky", THE MEDICAL JOURNAL OF AUSTRALIA, Volume I, 1938, page 661. W. L. Havard, *Royal Australian Historical Society, Journal and Proceedings*, Volume XXVI, 1940, page 46.)

J. Denis Macdonald, assistant surgeon on H.M.S. *Herald*, studied marine organisms. (J. J. Fletcher, *Proceedings of the Linnean Society of New South Wales*, Volume XLV, 1921, page 617.)

Nicolai Miklouho-Maclay studied medicine. (Frank S. Greenop, "Who Travels Alone", K. G. Murray Publishing Company, Sydney, 1944; reviewed in *Royal Australian Historical Society, Journal and Proceedings*, Volume XXXI, 1945, page 127.)

Alexander Morrison (1849-1913), Government Botanist of Western Australia, who practised in Subiaco, Perth, wrote the account of the vegetation of Western Australia in the "Western Australian Year Book" for 1900-1901. (See also J. H. Maiden, *Proceedings of the Royal Society of New South Wales*, Volume LV, 1921, page 164.)

Baron Ferdinand von Mueller, K.C.M.G., Ph.D., the noted Australian botanist, was M.D. (*honoris causa*, University of Rostock) and was trained as a pharmacist.

William Edward James Paradice (1897-1927), naval surgeon, was drowned in the loss of the *Greycliffe*. He had already distinguished himself as a naturalist. (Obituary, THE MEDICAL JOURNAL OF AUSTRALIA, Volume II, 1927, page 859, and also *Australian Museum Magazine*, Volume III, Number 5, January-March, 1928, page 169.)

S. R. Pittard, M.R.C.S., took up duties as curator of the Australian Museum, Sydney, in 1860 and died in 1862. (J. J. Fletcher, *Proceedings of the Linnean Society of New South Wales*, Volume XLV, 1921, page 631.)

Jean René Constant Quoy and Joseph Paul Gaimard were surgeons to de Freycinet's expedition on the *Uranie*, which arrived off Australia in 1818. Quoy discovered the white-winged wren (*Malurus leucopterus*) in Dirk Hartog's Island in 1820. They were also naturalists on the *Astrolabe* expedition under Dumont D'Urville in 1826-1829, on which vessel Pierre Adolphe Lesson, brother of R. P. Lesson, was botanical collector and surgeon. (*The Emu*, Volume XX, 1921, pages 170, 180. G. P. Whitley, *Royal Australian Historical Society, Journal and Proceedings*, Volume XIX, 1933, pages 307, 313, 314.)

Staff Surgeon Frederick Rayner of H.M.S. *Herald* was in Sydney in 1858. He collected insects and other land animals and sent specimens to Gould. (J. J. Fletcher, *Proceedings of the Linnean Society of New South Wales,* Volume XLV, 1921, page 616. G. P. Whitley, *The Emu,* Volume XXXVIII, October, 1938, page 154.)

Richard Sanders Rogers, D.Sc., of Adelaide, was an authority on Australian orchids; two orchids, *Pterostylis Rogersii* Coleman and *Prasophyllum Rogersii* Rupp, were named after him.

Dr. Sibbald, R.N., of the hospital at Port Essington, collected for Gould about 1846. (G. P. Whitley, *The Emu,* Volume XXXVIII, October, 1938, page 153.)

Dr. Stanger (1812-1854) went for health reasons as medical officer on a whaling vessel and visited Australia and New Zetland. Sorverby credited him with collecting *Chiton versicolor* and *Chiton lentiginosus.* (Iredale and Hall, *The Australian Zoologist,* Volume IV, Part 6, 1927, page 356.)

Dr. Stephenson lived at Chatham, Manning River, New South Wales. A. W. Scott, in describing the Bentwing Swift moth, *Zelotypia staceyi* (now *Leto staceyi*), in the *Transactions of the Entomological Society of New South Wales,* Volume II, 1869, said that the late Dr. Stephenson had sent him the male. (A. Musgrave, *The Australian Museum Magazine,* Volume IV, Number 12, October-December, 1932, page 411.)

Dr. James Stuart (not Stewart), an army surgeon, came to Sydney in 1833 or 1834, and was frequently employed at the Quarantine Station, Port Jackson. He visited Norfolk Island in the 1830's and 1840's. A collection of over 200 beautiful paintings of fishes and other animals is in the care of the Linnean Societ yof New South Wales. (J. J. Fletcher, *Proceedings of the Linnean Society of New South Wales,* Volume XLV, 1921, pages 609-611. G. P. Whitley, *Royal Australian Historical Society, Journal and Proceedings,* Volume XIX, 1933, page 323.)

Dr. John Vaughan Thompson (1779-1847), Deputy Inspector-General of Hospitals in 1836, was a distinguished zoologist. He was the author of the name Polyzoa. (J. J. Fletcher, *Proceedings of the Linnean Society of New South Wales,* Volume XLV, 1921, pages 626-7.)

GLUCOSE TOLERANCE CURVES BEFORE AND AFTER GASTRECTOMY.

By ANNE MOORE, B.Sc.[1]

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IT has been known for some time that there is a disturbance of carbohydrate metabolism in patients suffering from peptic ulcer and in patients who have undergone partial gastrectomy (Evenson, 1942; Lawrence, 1936).

After gastrectomy, patients may suffer from symptoms such as sweating, faintness and abdominal discomfort after meals. Adlersberg and Hammerschlag (1949) have divided these symptoms into two groups, those occurring soon after meals and those occurring several hours later. It is generally agreed that the late symptoms are due to hypoglycæmia (Adlersberg *et alii,* 1949; Gilbert *et alii,* 1947; Zollinger *et alii,* 1947; Schechter *et alii,* 1949). On the other hand, the early symptoms are thought by most workers to be due to mechanical factors (Adlersberg *et alii,* 1949; Zollinger *et alii,* 1947; Irvine, 1948; Schechter *et alii,* 1949), although other causes suggested are hyperglycæmia (Glaessner, 1947) and hypoglycæmia (Gilbert and Dunlop, 1947), whilst Gardiner (1948) suggests that all symptoms are psychological.

The type of glucose tolerance curve described as following gastrectomy (Lawrence, 1936; Gilbert *et alii,* 1947; Barnes, 1947) is the lag curve with a great and rapid rise of blood sugar level followed by a rapid fall to abnormally low levels. The rapid rise is thought to be due to rapid absorption (Evenson, 1942; Lawrence, 1936). Barnes (1947) considers that the ensuing hypoglycæmia is due to increased sensitivity to insulin caused by repeated hyperglycæmia. Others have suggested that there is increased secretion of insulin (Evenson, 1942; Gilbert *et alii,* 1947); but this is not supported by the finding that the lowest values do not necessarily occur in those cases in which the maximum value is high (Evenson, 1942; Schechter *et alii,* 1949). The symptoms are said to disappear in time (Evenson, 1942; Gardiner, 1948), but there is a difference of opinion as to how soon after gastrectomy they commence. Some workers (Irvine, 1948) state that they begin immediately after operation; others (Evenson, 1942; Barnes, 1947) that they begin only after some weeks or months. It has been suggested that this delay is due to the time required for the emptying mechanism to operate or for insulin sensitivity to be acquired.

Evenson (1942) has shown that though many patients suffering from peptic ulcer have normal glucose tolerance curves, there is a tendency for the maximum blood sugar level to be slightly raised and for the blood sugar level to remain above the fasting value a little longer than normal. Glycosuria was more common in his patients with peptic ulcer than in his series of normal subjects. A rise above 210 milligrammes *per centum* is considered by Evenson to be abnormal. He also states that symptoms of hypoglycæmia do not occur unless the blood sugar level is below 65 milligrammes *per centum.* Other workers (Platt *et alii,* 1949) have confirmed the fact that patients suffering from peptic ulcer have abnormal gluçose tolerance curves.

In the present series glucose tolerance curves were prepared before and after gastrectomy on patients attending the Clinical Research Unit suffering from gastric or duodenal ulcer, or with carcinoma of the stomach. An attempt was made to obtain a series of three curves from each patient before operation, and one and three or more months after operation. In a few cases the last curve was obtained at times up to two years after operation.

Method.

The patient fasted from 10 p.m. the previous day and was allowed only water to drink. Specimens of urine and capillary blood were collected before the administration of 50 grammes of glucose dissolved in about 150 millilitres of water. Subsequently blood was collected at intervals of half an hour and urine at intervals of one hour for three hours. All blood sugar estimations were carried out by the Maclean method. Urine specimens were tested for sugar with Benedict's reagent. Significant glycosuria was considered to be present if a "++" or "+++" Benedict's reaction was obtained.

Results.

Fifty-seven curves were prepared for 29 patients, of whom 20 underwent gastrectomy for peptic ulcer and nine for carcinoma. After gastrectomy only two of these patients (Cases I and XX) showed definite symptoms of hypoglycæmia three or four hours after meals, whilst five patients (Cases VII, XIV, XXIV, XXVI and XXIX) complained of early symptoms of nausea or faintness immediately after meals. During the test the patients did not show symptoms of faintness or discomfort.

The results of all tests are shown in Tables I and II, and typical series of curves for two patients are shown in Figure I. In our classification of these curves values above 185 milligrammes *per centum* are considered abnormal.

Of thetwelve curves obtained before operation, only one was normal. Six curves resembled those of mild diabetes and two the Maclean lag curve. From the remaining three patients curves were obtained in which the maximum blood sugar level did not exceed the normal threshold but failed to return to the fasting level in two hours. The blood sugar level did not fall to 65 milligrammes *per centum* in any of these curves.

Of twelve curves obtained one month after operation, one was normal, four resembled those of mild diabetes and the remaining seven were of the Maclean lag curve type. In one of the last-mentioned, the blood sugar level fell below 65 milligrammes *per centum* three hours after the ingestion of glucose.

[1] Working with the aid of a grant from the National Health and Medical Research Council.

TABLE I.

Glucose Tolerance Curves Before and After Gastrectomy.

Case Number; Patient.	Diagnosis.	Before Gastrectomy.							One Month After Gastrectomy.							Three Months or More After Gastrectomy.							Months.
		Milligrammes *per Centum.*				Glycosuria.	Comment.[1]		Milligrammes *per Centum.*				Glycosuria.	Comment.[1]		Milligrammes *per Centum.*				Glycosuria.	Comment.[1]	
I. J.C.	Duodenal ulcer.	99	182	213	149	97	75	+ +	L	87	205	225	163	126	109	75	Nil	L	93	219	132	77	33	105	93	+ +	L	4·5
II. A.V.	Carcinoma of stomach.	150	225	225	227	145	130	114	L	132	225	230	187	143	95	96	+	L	104	223	189	118	91	124	155	+ + +	L	3·5
III. L.N.	Duodenal ulcer.	108	144	168	204	215	157	168	D	62	134	206	150	118	102	77	+ +	L	58	177	106	49	61	70	80	+	RG	4·0
IV. G.S.	Duodenal ulcer.	90	109	136	121	125	82	82	Nil	116	181	140	104	104	128	131	+ +	N	74	146	94	67	75	71	87	+ +	RG	3·5
V. J.W.	Carcinoma of stomach.	92	157	162	143	137	131	108	Nil	66	167	229	209	164	110	84	+ +	D	62	132	202	136	119	83	74	Nil	L	4·0
VI. M.S.	Duodenal ulcer.	113	199	218	187	140	134	105	+ + +	77	178	214	178	97	74	52		L	71	189	136	106	92	80	67	+ + +	L	3·0
VII. E.C.	Duodenal ulcer.	100	135	200	165	135			+ + +										105	290	242	74	83	92	90	+ + + +	L	19·0
VIII. E.S.	Duodenal ulcer.	106	118	194	138	152	144	119	+										104	262	167	119	91	93	116	+ + +	L	3·5
IX. E.H.	Duodenal ulcer.	113	151	132	164	176	153	165	Nil										84	185	111	39	35	67	74	Nil	N	4·0
X. F.S.	Duodenal ulcer.	107	159	160	142	112	149	136	Nil										107	225	193	144	113	89	85	+	L	2·0
XI. J.B.	Duodenal ulcer.	88	222	210	155	128	98	101	Nil										105	160	137	124	81	102	107	Nil	N	3·5
XII. F.C.	Duodenal ulcer.	95	157	193	195	197			Nil										97	194	173	134	96	94	103	+	L	2·5
XIII. H.N.	Carcinoma of stomach.[2]									130	211	282	165	150	118	127	+ + +	L	66	189	162	108	75	61	41	Nil	L	7·0
XIV. H.S.	Duodenal ulcer.									94	179	229	138	102	149	131	+ + +	L	96	175	145	82	76	84	98	+ +	RG	4·0
XV. C.W.	Duodenal ulcer.									110	198	265	215	178	149	123	+ + +	D	95	193	173	94	90	99	77	+ +	L	6·0
XVI. A.T.	Duodenal ulcer.									108	206	203	119	90	103	110	+	L	76	161	175	89	54	89	63	+ +	N	6·0
XVII. F.F.	Carcinoma of stomach.[2]									73	148	218	275	218	193	166	Nil	D	70	218	196	175	128	106	94		D	7·5
XVIII. J.P.	Carcinoma of stomach.[2]									91	186	183	156	134	89	86	Nil	D										
XIX. H.S.	Carcinoma of stomach.[2]																		72	189	120	81	56	61	69	Nil	N	8·0
XX. G.H.	Carcinoma of stomach.																		100	159	164	176	110	96	96		N	7·0
XXI. J.W.	Duodenal ulcer.																		115	183	175	109	89	101	100	Nil	N	10·0
XXII. A.H.	Duodenal ulcer.																		79	173	148	89	87	91	108		N	8·0
XXIII. E.B.	Duodenal ulcer.																		88	174	81	85	84	84	92	Nil	N	12·0
XXIV. A.M.	Duodenal ulcer.																		88	178	118	118	106	77	96	Nil	N	9·0
XXV. A.W.	Duodenal and gastric ulcer.																		83	222	117	96	96	100	103	+	L	7·0
XXVI. W.J.	Carcinoma of stomach.																		163	218	126	87	75	84	85	+ + +	L	13·0
XXVII. H.D.	Gastric ulcer.																		96	204	233	132	62	65	84	+ +	L	24·0
XXIX. B.R.	Duodenal ulcer.																		83	304	260	179	131	102	101		D	3·0
XXIX. N.M.	Carcinoma of stomach.																		70	88	143	91	64	80	84	Nil	N	

[1] L = Maclean lag curve; D = diabetic type of curve; S.R.N = slow return to normal (but not exceeding threshold); N = normal; R.G = renal glycosuric curve.

[2] These patients underwent total gastrectomy—all others underwent subtotal gastrectomy.

Of the 28 curves obtained three or more months after operation, ten were normal, three renal glucosuric in type and 13 of the Maclean lag curve type, and two resembled those of mild diabetes. As more curves in this group than in the previous groups did not rise above the normal threshold, it was decided to examine further those patients from whom Maclean lag curves were obtained at the end of three months. Two-hour glucose tolerance tests were carried out on five of these patients who were available twelve to twenty months after operation, to ascertain whether the hyperglycæmia following the ingestion of 50 grammes of glucose had become less pronounced.

The results are shown in Table II. One curve is normal, two are of renal glycosuric type and two are of the Maclean lag curve type. In only one of the five cases is the maximum value as high as before.

Although the blood sugar level fell below 65 milligrammes *per centum* one and a half to two and a half hours after the ingestion of glucose in 11 of the 28 cases (seven in Table I and four in Table II), the patients complained of no discomfort during the test. These patients with hypoglycæmia were not the ones who gave the highest maximum values. In eight of the 11 curves showing values below 65 milligrammes *per centum* the normal threshold was not exceeded. Of 14 curves obtained two to five months after gastrectomy, three revealed hypoglycæmia, whilst of 19 obtained six to twenty-four months after operation, eight revealed hypoglycæmia. The development of hypoglycæmic curves with the passage of time after operation was also noticed in individual cases, as of five patients who were not affected by hypoglycæmia after three months, four were affected by it after twelve to twenty months.

Apparently the tendency to hypoglycæmia increases with the passage of time, while the tendency to hyperglycæmia decreases.

It was also noticed that eleven patients in this group had fasting blood sugar levels below 80 milligrammes *per centum.*

Effect of Diet.

A patient (Case VII), from whom a typical Maclean lag curve was obtained after partial gastrectomy for duodenal ulcer, was investigated to determine the effect of diet on the glucose tolerance curve after gastrectomy.

The glucose tolerance test was repeated while the patient was still receiving a normal diet. This curve was similar to the previous ones. After ingestion of a diet rich in carbohydrate for two weeks the test was repeated and again one week later. The diet was then changed to one of high fat content (170 grammes per day) for four weeks and the test was again repeated. The curves were all within the normal limits of variation as shown in Figure II. This suggests that, provided the diet is adequate, it has no appreciable effect on carbohydrate tolerance in patients from whom the lag type of curve is obtained after partial gastrectomy.

Glycosuria on Normal Diet after Gastrectomy.

As it was thought that patients who had had a partial gastrectomy and who had glycosuria when taking a normal diet might be labelled as being diabetic, 12 patients were examined as follows. On two occasions specimens of urine were collected after a carbohydrate-rich meal (in Cases II and XVII two months after gastrectomy, and in Cases I, XIV and XX to XXVII after three or more months). These specimens were tested for sugar by means of Benedict's reagent. Eleven patients were found to have no glycosuria, and the urine of one (Case XIV) strongly reduced Benedict's reagent in each specimen, though he had no symptoms of diabetes.

Discussion.

These results show that carbohydrate metabolism is altered after gastrectomy, thus confirming the findings of other workers. Wider recognition is now being given to the fact that patients suffering from simple peptic ulcer or carcinoma of the stomach tend to have abnormal glucose tolerance curves, even before operation, as has been

TABLE II.
Glucose Tolerance Curves (Late) Before and After Gastrectomy.

Case Number; Patient.	Before Gastrectomy.[1]	One Month After Gastrectomy.[1]	Two to Four and a Half Months After Gastrectomy.	Fourth Curve.							
				Milligrammes per Centum.					Glycosuria.	Comment.[1]	Time. (Months.)
I. J.C.	L	L	L	71	183	165	52	43	+++	RG	20
II. A.V.	L	L	L	80	186	115	62	66	Nil	L	19
VI. M.S.	D	L	L	79	146	134	47	67	+++	RG	12
X. F.S.	N	—	L	90	184	155	94	30	Nil	N	16
XII. F.C.	D	—	L	82	176	192	114	96	+	L	17

[1] L = Maclean lag curve; D = diabetic type of curve; SRN = slow return to normal (but not exceeding threshold); N = normal; RG = renal glycosuric curve.

shown by Evenson (1942) for ulcer patients. This abnormal curve resembling that of mild diabetes probably results from poor diet, low carbohydrate or vitamin *B* content or from inadequate absorption of food, either of which causes decreased carbohydrate tolerance.

A number of our patients before operation were taking diets deficient in carbohydrate or vitamin *B*, though there was no obvious correlation of the diet with the type of glucose tolerance curve.

Platt *et alii* (1949) found that patients suffering from peptic ulcer gave abnormal intravenous glucose tolerance curves, which is in accordance with this explanation.

them to develop until some months after operation. Barnes (1947) and Adlersberg and Hammerschlag (1949) state that this frequently does take place. Gilbert and Dunlop (1947) state that symptoms gradually diminish with time in spite of the persistence of hypoglycæmic levels, and suggest that this is due to the development of tolerance to low blood-sugar levels. None of our patients complained of unpleasant symptoms during the test, even when the blood sugar level was below 65 milligrammes *per centum*. However, it is possible that had they been working at the time symptoms would have appeared, as the hypoglycæmia might have been accentuated.

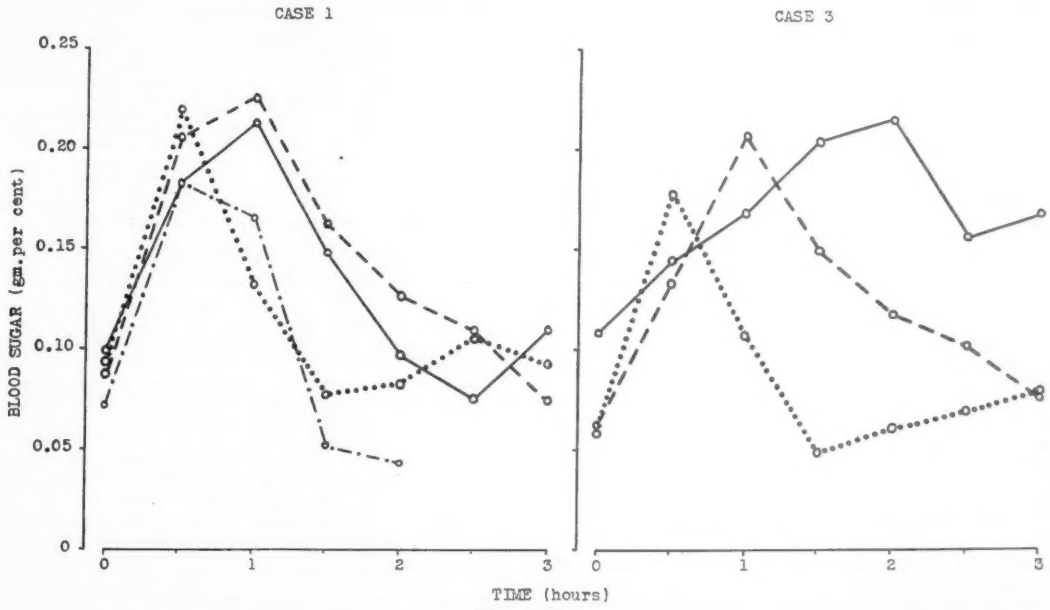

FIGURE I.

Glucose tolerance curves before and after subtotal gastrectomy. Continuous line, before gastrectomy; interrupted line, one month after gastrectomy; dotted line, three months after gastrectomy; dashes and dots, twenty months after gastrectomy.

For a month after operation the curves are similar, but the return to normal fasting level is slightly more rapid.

Though the effect of poor diet may still be felt at this time, it is considered that the main cause of hyperglycæmia now lies in the altered mechanism with more rapid gastric emptying and consequent rapid absorption of glucose.

At three months the blood sugar tends to return even more rapidly to the fasting level and the peak value is less. This change progresses with time. In only two of the 28 curves obtained three months after gastrectomy was the blood sugar above the normal level after two hours. It was in this group that hypoglycæmic values were found in 11 out of 28 cases.

Thus if the symptoms from which gastrectomy patients suffer are caused by hypoglycæmia, one would not expect

After some months the fall from the maximum value occurs more rapidly. This must be partly due to the fact that the patient is better nourished, and is in accordance with the finding by Schechter and Necheles (1949) that intravenous glucose tolerance curves from patients who have undergone gastrectomy are normal. No convincing explanation of the occurrence of hypoglycæmic levels has been put forward, though disturbed liver function (Hastings-James, 1949) and a blood sugar lowering substance in the mucosa (Schecter *et alii*, 1949) have been suggested.

The results in the present series show that the lowest blood sugar levels are not always obtained from those patients giving the highest maximum values (see Tables I and II). Thus it would seem that increased production

of insulin or sensitivity to insulin due to hyperglycæmia will not explain the hypoglycæmia. The hyperglycæmia which still occurs in some patients several months after operation must be due to the emptying mechanism and rapid absorption. However, many patients no longer reach high blood sugar levels. It is suggested that the stimulus of undigested foods continually reaching the jejunum may cause adaptation of the mucosa to a type that will absorb less readily.

Certainly, immediate passage of glucose into the jejunum does not always cause excessive hyperglycæmia, as is shown by the fact that the four patients of our series who had had total gastrectomy did not yield very high values of blood sugar. These patients are those who are most likely to have adaptation of the mucosa of the small bowel, as their food always reaches the small bowel in an almost completely undigested state. None of these four patients showed clinical signs of obstruction, and two of them were shown by X-ray examination to have rapid passage of barium into the small bowel.

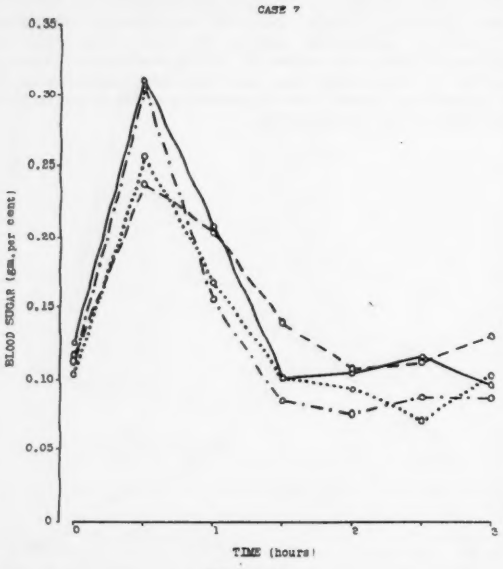

FIGURE II.

Case VII: Glucose tolerance curves after subtotal gastrectomy with different diets. Continuous line, after normal diet; interrupted line, after carbohydrate-rich diet for two weeks; dashes and dots, after carbohydrate-rich diet for three weeks; dotted line, after fat-rich diet for four weeks.

Adlersberg and Hammerschlag (1949) have suggested that pre-operative glucose tolerance tests may give some indication of the patient's susceptibility to hypoglycæmia. However, our results have shown that patients whose curves before operation do not fall either rapidly or to low levels, may present curves with a rapid fall to low levels a few months after gastrectomy.

It is important to note that in patients with ulcer or carcinoma or in patients who have undergone gastrectomy, glycosuria may occur. There is thus a risk that in these cases a diagnosis of true diabetes may be made.

Summary.

1. Twenty-nine patients have been examined, of whom 20 required gastrectomy for peptic ulcer and nine for carcinoma. To determine the effect of gastrectomy on the glucose tolerance curve, glucose tolerance tests were carried out when possible before gastrectomy, and one, three, and in some cases many months after gastrectomy.

2. It has been shown that glycosuria may occur after a normal meal in patients who have undergone subtotal gastrectomy.

3. Patients suffering from an ulcer or carcinoma of the stomach yield glucose tolerance curves which tend to rise above normal and to be slow in returning to normal.

4. About one month after operation the curves are of a similar nature, but the return to normal is slightly more rapid.

5. Three months after operation the curves sometimes show low fasting levels, and the blood sugar level may rise above 180 milligrammes *per centum* but usually return to normal in two hours or less. Levels of blood sugar below 65 milligrammes *per centum* are more frequent in this group. This change becomes greater with the passage of time.

6. The lowest levels of blood sugar do not necessarily follow the highest rises.

7. The suggestion is put forward that the mucosa of the upper part of the jejunum is adapted in the direction of slower absorption, and that thus abnormally high blood sugar levels are not reached during the glucose tolerance test.

8. Our results for one patient after gastrectomy suggest that the type of food eaten has no effect on the Maclean lag curve, the diet being adequate.

Acknowledgements.

I am indebted to Dr. Ivan Maxwell and Dr. Leo Doyle for some of the cases presented in this paper, and I wish to thank the members of the Clinical Research Unit for their help.

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A METHOD FOR THE COLLECTION OF THE SECRETIONS OF THE INDIVIDUAL ACCESSORY SEX GLANDS IN A MARSUPIAL (TRICHOSURUS VULPECULA).

By V. S. HOWARTH.

From the Gordon Craig Research Laboratories, The University of Sydney.

THE investigation of the prostatic function in man and laboratory animals has frequently been hampered by the difficulty associated with collection of the gland's specific secretion in any quantity. A good deal of work in this field has been done by means of prostatic isolation operations as described by Eckhard (1863) and Farrell (1931), but because of the technical difficulties, only "acute" experi-

ments were carried out. Huggins, Massina, Eichelberger and Wharton (1939) devised an isolation operation in the dog, which made possible the quantitative collection of prostatic fluid and the examination of its biochemical characteristics. Batelli (1921) described a method of obtaining semen from the guinea-pig by means of electrical stimulation, and this method was subsequently employed by Moore and Gallagher (1930). Gunn (1936) developed a modification of Batelli's method of semen collection, which he applied to sheep in fertility studies, and which has been widely used for the purpose of artificial insemination in this animal.

From the experimental viewpoint the direct examination of semen has obvious limitations, as it is a mixture of the secretions of various glands.

During an investigation into the functions of the accessory sex glands of the common phalanger or possum (*Trichosurus vulpecula*), the necessity for obtaining the secretions of these glands and of the prostate gland in particular led to a trial of Batelli's method. The modification as introduced by Gunn was found to be the more suitable for the experimental production of an ejaculate and for the collection of the individual secretions of the accessory sex glands as will be described.

The technique, as applied to the phalanger, is as follows: The animals are lightly anæsthetized by ether and an electrode consisting of a hypodermic needle is inserted into the *musculus sacrospinalis* just below the last rib. The second electrode, a brass rod, insulated in such a way as to leave one centimetre of its tip conductive, is inserted into the rectum for a distance of three or four centimetres. By means of a transformer, the voltage is stepped down from 240 volts, alternating current, and 50 cycles per second, to 30 volts, alternating current, and 50 cycles per second. Three stimuli, each of ten seconds duration, are applied to the animal at intervals of one minute. Each stimulus throws the animal into a generalized tonic seizure and opisthotonos. A profuse secretion from the paracloacal glands occurs (Bolliger and Whitten, 1948). The penis becomes semi-erect, and when the stimulus is terminated the animal relaxes and seminal fluid is emitted. After three stimuli no further emission of seminal fluid is usually obtainable. The seminal fluids are uncontaminated by urine and able to be collected independently of the paracloacal secretions.

The procedure does not appear to have any harmful effects on the animal, which rapidly recovers, and it can be stimulated repeatedly at intervals of three or four days with no obvious harmful sequelæ. Volumes up to 31 millilitres of semen have been collected from one animal after the application of the three stimuli as described, but a more usual volume is in the vicinity of five to ten millilitres. It would appear that there is a seasonal variation of the volume of the ejaculate in this animal, during winter months the whole of the accessory sex gland activity being at its lowest level. The fluid collected has shown a variable tendency to rapid clotting.

The ejaculate contains many motile spermatozoa, and sperm counts of up to 136,000,000 per millilitre have been observed. Spermatozoa can be excluded from the ejaculate by means of a soft bowel clamp placed across the neck of the prepenile section of the scrotum.

Cowper's glands have been successfully surgically extirpated and pure prostatic secretion has been collected at will and in volumes of 10 to 30 millilitres at a time. A complete prostatectomy has been performed, the technique of which will be described elsewhere (Howarth, 1949). Thus the secretions of Cowper's glands or of the prostate gland can be obtained independently and with or without mixture with spermatozoa. Since seminal vesicles are absent in *Trichosurus vulpecula*, the whole of the accessory sex gland secretion can be fractionated by the methods described.

The prostatic fluid obtained from *Trichosurus vulpecula*, the characteristics of the spermatozoa, and the secretion of the Cowper's glands are being investigated.

Summary.

1. A method is described of obtaining in quantity the separated secretions of the accessory sex glands of a marsupial (*Trichosurus vulpecula*) by electrical stimulation.

2. The contributions of the individual accessory sex glands to the ejaculate can be separated by suitable surgical methods.

Acknowledgement.

This work has been carried out during the tenure of the Gordon Craig Fellowship in Urology in the University of Sydney, 1947-1950.

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Reviews.

SELECTIVE PARTIAL ABLATION OF THE FRONTAL CORTEX.

"SELECTIVE PARTIAL ABLATION OF THE FRONTAL CORTEX" is a report by forty-three collaborators under the Columbia-Greystone project.[1] The project, undertaken by members of the Columbia University and staff of the Greystone Park Mental Hospital, New Jersey, was designed to study the effects of topectomy, or ablation of certain frontal areas of the brains of human psychotic patients. Forty-eight patients, as nearly as possible alike both physically and mentally, were selected from the large population at Greystone Park Mental Hospital. Twenty-four were subjected to operation and twenty-four were used as controls. Everything was done to stabilize conditions, even to subjecting the control group to anæsthesia, but not to operation.

Prior to operation all forty-eight patients underwent a battery of investigations, including physical examination, laboratory investigation, audiometric and vestibular studies, visual examination, X-ray examination of gastro-intestinal mobility, electroencephalography, psychological, neurological and pathological investigation. These examinations were again performed at fixed intervals after the time of operation on both those operated on and controls, up to one year.

So many physiological tests were performed that it is impossible to enumerate their results in a book review, but it is obvious that no gross changes were produced by operation, though several interesting psychological changes were found. For instance, changes were independent of age, intellect, sex or years of hospitalization. There was no loss of memory, intellect or learning due to operation, and there was a marked decrease of anxiety, self-consciousness and hypochondriasis following operation.

It appears that patients over forty years of age who had Brodmann areas 9, 10 and 46 removed made the best social recoveries. In short there were a loss of emotional tension

[1] "Selective Partial Ablation of the Frontal Cortex: A Correlative Study of its Effects on Human Psychotic Subjects", by The Columbia-Greystone Associates; edited by Fred A. Mettler, M.A., Ph.D.; 1949. New York: Paul B. Hoeber, Incorporated. 10" × 7", pp. 540, with a few illustrations. Price: $10.00.

and a better social adjustment. It is interesting to note that following the operation there was a transient increase in abnormal behaviour, followed by an improvement, particularly if the above-mentioned areas were ablated. Improvement in the results of many of the psychological tests was due to better concentration and lessened distractibility following operation.

It was noticeable also that if two large areas or several small areas were removed, signs of deterioration in social behaviour were evident. This is also seen in leucotomy patients when large areas of cortex are undercut.

It is felt that the project has been a good step in the right direction, a good starting point for larger and more complete investigations, for it is admitted by the editor that the series of patients has been too small to allow any definite conclusions to be reached, but the ideas put forward are sound.

The findings should be regarded as reports of investigations, rather than as dogmatic results, but nevertheless many of our earlier ideas of the functions of the frontal lobes have been disturbed and the book stimulates further investigation of these functions.

It is considered that all neurosurgeons and psychiatrists will find this book of absorbing interest, and it is hoped that the editor and his collaborators will continue this work with a larger number of patients as it is the first time that such an intensive study of the frontal lobes of the brain has been undertaken.

CARDIO-VASCULAR FAILURE.

CIRCULATORY FAILURE is of such frequent occurrence as to be of interest to all those practising general medicine. "Failure of the Heart and Circulation", by Terence East, is a clear and concise account of the subject from a clinical point of view.[1]

This small book contains much up-to-date information well set out and indexed and therefore easily accessible.

Practitioners will find assistance in recognizing the presence and degree of failure and also in the institution of effective treatment in specific instances.

OPHTHALMIC MEDICINE.

IT is a quarter of a century since the second edition of "Medical Ophthalmology" made oculists indebted to its author, Foster Moore. Nothing has happened to bridge the gulf to the present, until J. H. Doggart published his work.[2] It would be trite to say that many developments have taken place in this quarter-century; but it would be very difficult to find another author who could produce a volume of comparable worth. Not only does he present ocular diseases and disorders as they are found in association with changes found elsewhere in the body, but he does so in a most admirable manner. He possesses a grace in expression that adds pleasure and ease to the reading of his chapters. Those who have read Mr. Doggart's other works expect clear, comprehensive and accurate writing. Not only does his writing reflect a classical education, but he reveals a philosophical outlook and a sympathetic insight towards patients and their problems. Here is wisdom expressed with humour.

Apart from chapters dealing with "the history of the case" and methods of examination and differential diagnosis based on signs and symptoms, there is one dealing with all the main general disorders that have ocular manifestations. They include tuberculosis, metabolic and blood disease, venereal disease and virus, fungous and zymotic infections.

Of greatest value to the physician perhaps are the discussions of cardio-vascular, renal and diabetic changes. The work is profusely illustrated and the illustrations, eight of which are in colour, have been culled from every source; some are old favourites of proved value, and others are copies from remote writings. Those showing biomicroscopic views are beautiful. The author has kept this work in reasonable limits, 330 pages, and for this the busy practitioner is also grateful.

[1] "Failure of the Heart and Circulation", by Terence East, M.A., D.M., F.R.C.P.; Second Edition; 1948. London: Staples Press, Limited. New York: Staples Press Incorporated. 7¼" × 5", pp. 148. Price: 8s. 6d.

[2] "Ophthalmic Medicine", by James Hamilton Doggart, M.A., M.D. (Cantab.), F.R.C.S. (England); 1949. London: J. and A. Churchill, Limited. 9¾" × 6", pp. 344, with 87 illustrations, 28 coloured. Price: 32s.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"The 1949 Year Book of the Eye, Ear, Nose and Throat": The Eye, edited by Derrick Vail, M.D., D.Oph. (Oxon.), F.A.C.S.; The Ear, Nose and Throat, edited by Samuel J. Crowe, M.D., with the collaboration of Elmer W. Hagens, M.D.; 1949. Chicago: The Year Book Publishers, Incorporated. 7" × 5", pp. 584, with 125 illustrations. Price: $5.00.

A review of literature relating to the eye, ear, nose and throat which became available from August, 1948, to October, 1949.

"Infection and Sepsis in Industrial Wounds of the Hand: A Bacteriological Study of Ætiology and Prophylaxis"; Privy Council. Medical Research Council Special Report Series No. 266, by R. E. O. Williams and A. A. Miles (Assisted by Barbara Clayton-Cooper and Brenda Moss); 1949. London: His Majesty's Stationery Office. 9¾" × 6", pp. 88. Price: 1s. 6d.

The results of investigations from 1942 to 1945 at the Wound Infection Research Unit at the Birmingham Accident Hospital.

"The Surgical Clinics of North America" (issued every two months); 1949. Philadelphia and London: W. B. Saunders Company, Limited. Melbourne: W. Ramsay (Surgical) Proprietary, Limited. Philadelphia Number. 9" × 5", pp. 310, with 40 illustrations. Price: £7 5s. *per annum* (cloth binding), £6 *per annum* (paper binding).

This is a Philadelphia Number comprising a symposium of recent advances in "surgical physiology". The seventeen articles have been selected by Dr. I. S. Ravdin.

"The Medical Clinics of North America" (issued every two months); 1950. Philadelphia and London: W. B. Saunders Company. Melbourne: W. Ramsay (Surgical) Proprietary, Limited. Chicago Number. 9" × 5", pp. 324, with 54 illustrations. Price: £7 5s. *per annum* (cloth binding), £6 *per annum* (paper binding).

This is a "Chicago Number" and a symposium on pædiatrics comprising 21 articles, covering a variety of subjects, intended chiefly for general practitioners.

"Primer of Allergy: A Guide for those who must find their way through the Mazes of this Strange and Tantalizing State", by Warren T. Vaughan, M.S., M.D., revised by J. Harvey Black, M.D.; Third Edition; 1950. St. Louis: The C. V. Mosby Company. Melbourne: W. Ramsay (Surgical) Proprietary, Limited. 7½" × 5", pp. 178, with a few illustrations. Price: 36s. 9d.

Revised by Dr. J. Harvey Black after the death of Dr. W. T. Vaughan.

"The Diagnosis of Hysteria", by D. W. Abse, M.D., B.Sc., D.P.M., with a foreword by John H. Ewen, F.R.C.P. (Edinburgh), D.P.M.; 1950. Bristol: John Wright and Sons, Limited. London: Simpkin Marshall, Limited. 7¼" × 5", pp. 130, with seven illustrations. Price: 8s. 6d.

An attempt to convey practical and useful information on a difficult diagnostic problem.

"Electrocardiography: Fundamentals and Clinical Application", by Louis Wolff, M.D.; 1950. Philadelphia and London: W. B. Saunders Company. Melbourne: W. Ramsay (Surgical) Proprietary, Limited. 9¾" × 6¾", pp. 192, with 110 illustrations. Price: 42s. 9d.

The author deals with the basic principles of electrocardiography without reference to "patterns".

"Clinical Pathology: Application and Interpretation", by Benjamin B. Wells, M.D., Ph.D.; 1950. Philadelphia and London: W. B. Saunders Company. Melbourne: W. Ramsay (Surgical) Proprietary, Limited. 9" × 6", pp. 410, with a few illustrations. Price: 57s.

The author has tried "to assemble and reorganize the common data of clinical pathology, and to answer some of the questions that confront physicians in the clinic and at the bedside".

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The Medical Journal of Australia

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THE SOCIAL SIGNIFICANCE OF SYMPTOMS.

A CAREFUL medical practitioner bases his diagnosis and treatment on two groups of data—a statement by the patient about the history of his illness and how he feels, and an array of facts discovered by himself in his examination of the patient and his surroundings. Information may, of course, be offered by, or sought from, relatives or other responsible persons in the patient's immediate environment. There are no mechanical means by which a doctor can set out before himself the patient's symptoms and signs, give a value to each and state an unequivocal diagnosis on which treatment and prognosis may be based. If this could be done we should find in every doctor's consulting room an apparatus something like the mechanical sorting machines that are used in large surveys and investigations, holes being punched in different parts of a card to represent "yes" or "no", "good", "bad" or "indifferent", or "clean", "dirty", "alcoholic" and so on. Even if such a business could be carried out, the doctor would need to be strictly impartial when he gave a value to a finding—he would have to punch the hole in the right place in the card. So much for the doctor. The story told by the patient presents the widest variations. These variations may be the result of no devious intention. No two patients describe or interpret symptoms and signs in quite the same way, and a patient may, with no desire to deceive, vary his description according to the way in which he is feeling at the time or the person to whom he is talking. This reminds one somewhat of the comedian who in his description of women said that "you never see two alike any one time and you never see one alike twice". The doctor's object in his treatment is to recover the patient of his disease and to fit him to take his place in society as an individual able to earn his living and to enjoy his leisure in the way that appeals to him most. It is probably true that most patients are prepared to cooperate with the medical attendant towards this end. But there are some, knaves or persons affected with mental laziness, who know or discover that the persistence of symptoms may give protection from unpleasant happenings or from the tasks of everyday life. The symptoms of these people receive peculiar emphasis at their hands and often become unpredictable, and they certainly add to the difficulties of medical practice. William Gooddy, who is registrar of the National Hospital, Queen Square, London, thinks that the employment of symptoms has become part of the everyday technique of social existence.[1] He entitles his article "The Social Significance of Symptoms"; what he writes and the views of several correspondents replying to him[2] are worthy of notice. He states that, by claiming symptoms of diseases from which they do not suffer, persons can obtain the same sympathy and concessions as would be their right if in fact they had those diseases. "Thus the idle and the improvident make good their losses and the criminal escape their punishment." Gooddy is undoubtedly right in his contention that people today make more use of their symptoms for ulterior ends than they did in the past; whether it has become "part of the everyday technique of social existence" is perhaps open to argument. The shortages of war-time and the restrictions imposed on members of the community on that account and also because of financial stringency have not encouraged them to avoid self-seeking or to refrain from trying to gain an advantage over their fellows by fair or unfair means. Gooddy also points out that social security has become the prerogative of us all and that much of it is administered through medical channels. This all means that the stage is set for those who care to exploit real or imaginary symptoms.

Gooddy discusses the problem from the clinical and from the social points of view. In regard to the clinical he states that "there can be few who practise medicine nowadays who have not been faced with the blackmail of gastritis, fibrositis, blackouts, dizzy turns, or like diagnoses. . . .". In the strict legal sense the word blackmail cannot be used as Gooddy uses it, but we know what he means—the implied threat is what counts. Gooddy refers to the extraordinary symptoms of which some of these patients complain and to the equally extraordinary phenomena to which they liken them—"like broken glass in my stomach", or "as if the top of my head was open and someone was pouring cold water into it". He shows that general examination reveals no structural defects, though poor mental and physical development is sometimes found. One important statement is that the patient has a high nuisance value which weighs upon the examiner. On the social side Gooddy divides the problem between the patient and the doctor. The largest single factor in the patient is, he states, derived from the inborn and acquired defects of human equipment. We all know that some of the defects referred to are familial and there is no doubt that Gooddy is correct when he states that many patients seek medical advice for symptoms which are due to failure to secure privacy, quiet, beauty or comfort in their own homes. With the housing conditions of the present day privacy and quiet are unknown to many persons. They have not learned that "better is a dry morsel, and quietness therewith, than an house full of sacrifices and strife". The subject of peace and quietness has an important bearing on this whole matter. One of the basal requirements only can be stated at present—it comes from La Rochefoucauld—that when a man finds no peace within himself it is useless to seek it elsewhere.

[1] *The Lancet*, February 11, 1950.
[2] *Ibidem*, February 25, 1950.

Those who are at peace within themselves are unlikely to be numbered among the persons with whom Gooddy is concerned. And this brings us to the general conditions of social life. He thinks that the medical profession can do no more than advise general principles in matters social and eugenic. "We are all aware that dirt and poverty, ignorance and slums, contribute grossly to disease; but we cannot make each patient who enters an out-patient department clean, rich, educated at a public school, and housed in a service flat." Taken by itself, this statement betrays a defeatist attitude, but the general tenor of what Gooddy writes is not defeatist. Two of his critics take him up and admit that we cannot make all our patients "clean, rich, educated at a public school"; they add that even if we could do this, we could not promise immunity from the ills under discussion. Their view is correct—that we can take part in the fight against bad social conditions, and that if we are not prepared to do so we must accept the medical problems which they create.

Before anything in the way of a remedy is mentioned another side to this so-called blackmailing business should be referred to. Gooddy remarks in his discussion on the social aspect that the faults of the doctor are perhaps equal to those of the patient, and he thinks that they result mostly from failure to make an exact diagnosis. The correspondents previously mentioned are more direct: "A general practitioner is economically dependent on the good will of his patients. The 'altercations and scenes' which he risks by an honest approach are not the only cause of his reticence. He may lose the patient and his family and friends, and their capitation fees." The practitioner who trifles with the patient because of the urgent fear that he will lose the patient and his friends together with their fees, is just as guilty as the patient of the offence for which we have accepted the term blackmail. No other conclusion is possible. Gooddy remarks that in the practice of medicine self-seeking is the rarest of diagnoses. Circumstances may arise in which this diagnosis has to be given, but almost always the task of the practitioner is to try to lead the patient along the right psychological path. This may be difficult and it may also take a great deal of time, but the attempt must be made. The doctor must understand his patient and he must help the patient to understand himself. We may conclude with the advice of Lord Horder to medical students at Westminster, quoted by one of the correspondents: "*Un peu de savoir, assez de faire savoir, et beaucoup de savoir faire.*"

Current Comment.

THE DISADVANTAGES OF SULPHATHIAZOLE.

With the advent of penicillin and succeeding antibiotics the sulphonamides slipped out of the limelight, and an increasing realization of the disadvantages associated with practically all forms of sulphonamide therapy has brought these drugs into a stage almost of disfavour. Nevertheless, they have certain advantages, in relation to cost, availability and convenience of administration, and undoubted therapeutic efficacy if used rightly. It is all the more important then that they should be reliably assessed. In this regard it is interesting to note a recent decision of the Council on Pharmacy and Chemistry of the American Medical Association[1] to omit sulphathiazole and sulphathiazole sodium from "New and Nonofficial Remedies", and to declare mixtures of sulphathiazole or sulphathiazole sodium with other agents unacceptable for inclusion in that publication. The decision was based on two facts: the first that approximately 18% of patients who receive sulphathiazole experience untoward reactions—fever, rash, acute leuchæmia, leucopenia, and other signs of toxicity (which compares with about 16% for sulphapyridine, 12% for sulphanilamide, 6% for sulphadiazine and 7% for sulphamerazine); the second that less toxic sulphonamide drugs, as well as penicillin and streptomycin, are now available. The withholding of official acceptance from mixtures containing sulphathiazole or sulphathiazole sodium is a natural corollary. The decision may be compared with the deletion of sulphapyridine from the British Pharmacopœia, 1948. The number of sulphonamide drugs now having general official approval is small indeed.

THE TREATMENT OF PARKINSONISM.

The Parkinsonian syndrome attracted considerable attention after the 1914-1918 war, owing to the number of unfortunate persons who suffered from cerebral sequelæ of encephalitis. Should we ever encounter another epidemic of the so-called lethargic encephalitis it is highly improbable that the same clinical phenomena will be seen in all respects, and sequelæ, should they occur, would probably follow a somewhat different pattern. Therefore it is improbable on *a priori* grounds that the groups of people all over the world who still demonstrate in their nervous systems the ravages of this generation-old epidemic will be replaced by another similar group. This is another way of saying that the call for special treatment of the disabling and unhappy state called parkinsonism is likely to become less clamant as time goes on. However, this is no argument against encouraging further inquiries into the pharmacology of those atropine-like substances that have proved so useful. In any case, parkinsonism, if far from being the only condition for which they have been found of value, and cerebral arteriosclerosis will still continue to produce a clinical state strongly resembling, though not identical with, that due to encephalitis. Though the arteriosclerotic patient responds less well to such medication than the post-encephalitic, he still needs relief. Of recent times new drugs have been introduced for this purpose, free to some extent from the more troublesome side effects of atropine and its congeners, and lessening rigidity, tremor and other symptoms. Michael Canelis, Frederick J. Farnell and Thomas H. McGavack have published an account of another type of antispasmodic drug.[2] This is "Artane", whose structure is represented by the chemical name 3-(1-piperidyl)-1-phenyl-1-cyclohexyl-1-propanol hydrochloride. Tests in animals suggested that it might be of value in the treatment of parkinsonism. Its relaxing action on plain muscle was half that of atropine, but twenty times that of "Trasentin", and its excitant properties were small. It had no histamine-like qualities, and its inhibitory effect on salivation was slight. The series of patients observed by these authors is not large, but the results are encouraging. Twenty-three patients were treated by "Artane" for periods ranging from ten to forty-six weeks. Of these, only six belonged to the arteriosclerotic or so-called idiopathic group; the remainder were of the post-encephalitic group. Previous to the trials the patients were receiving either atropine or hyoscine, which gave a certain degree of relief in all instances, but the drug was suspended for a month before the test period. The effects of the new drug were assessed by keeping a record of the incidence and degree of the outstanding symptoms of the syndrome, principally rigidity, tremor, disordered gait, undue salivation, mental disturbances, and in a few cases oculogyric crises. Tremor was greatly

[1] *The Journal of the American Medical Association*, September 24, 1949.
[2] *The American Journal of the Medical Sciences*, December, 1949.

relieved in most of the patients, and disturbances of gait also; rigidity was lessened in all but one patient, but the degree of lessening was only slight in nearly half. Salivation was controlled in only less than half the subjects of the test. Mental confusion was increased in one senile patient, but there were no other unusual symptoms. In order to minimize the effects of suggestion—an important matter in patients of this class—the genuine drug was withdrawn after ten weeks of treatment and the patients were given a *placebo*, unknown to themselves. In fact, similar packaging was employed, so that even the nursing attendants were unaware of the change. This substitution caused a dramatic regression of the patients' condition. Some who had started to get about were again confined to bed, others had troublesome tightness of the muscles, one had difficulty in articulation, tremors increased, and most of the patients had difficulty in feeding themselves and showed less ability to walk comfortably. At the end of three days the drug was restored and in another three days most of the lost ground had been regained. It is interesting that at the start of treatment the patients had shown various degrees of recession, owing to their having all treatment withheld for a month, and after a period of three days of administration of "Artane" definite improvement was noted. These experiments encourage further trials of this drug. Pharmacologists may yet give us something even better.

FLEAS.

IN some parts of Australia there is at the present time a plague of fleas. Only those who have had to endure such an event know how horrible and difficult it can be. Apparently Northern California is constantly affected in this way, and C. J. Lunsford read a paper on the subject in April, 1948, at the annual meeting of the American Dermatological Association.[1] The three species of fleas most commonly attacking man in the United States are the human flea (*Pulex irritans*), the cat flea (*Ctenocephalides felis*) and the dog flea (*Ctenocephalides canis*). The eggs of all these species hatch in the nests or resting places of their hosts, rarely on their bodies, or else in dust or organic debris in buildings. The life cycle of the flea lasts for about two weeks. They possess an advantage when they emerge from the cocoon that they are usually "very fat" and can live for several months under favourable conditions without feeding. The female flea must have a blood meal before her eggs can be fertilized and most fleas visit the body of the host for relatively short periods for the purpose of obtaining a blood meal. Lunsford points out that the life cycles of fleas are influenced by meteorological factors. Low atmospheric humidity is inimical to them and indeed the length of time required for each developmental stage is largely determined by the prevailing temperature and humidity. The clinical picture of the reaction to flea bites is known to most people. It is described by Lunsford as a grouped, itching, urticarial, papular eruption, some papules of which contain a central red punctum. The appearance of the lower extremities and abdomen of a susceptible person in a flea-plague centre is not easily forgotten. One of those who took part in the discussion on Lunsford's paper said that he had counted 500 lesions on one member of his family. What is not generally realized is that in some cases a generalized papular urticaria is present. These papules are not all due to bites—in fact only a few bites might have been inflicted. They are "an expression of sensitivity to the antigen injected by the flea as he bites". Lunsford goes so far as to state that in his practice most conditions diagnosed as "papular urticaria" are really the result of flea bites. Other observers have held this view. It has been noted that patients with these severe skin manifestations manifest remarkable abatement of lesions when they are admitted to hospital, but suffer a relapse when they return to their previous environment. This should at once arouse suspicion, if fleas have not already been thought of. Lunsford gives many references to the literature to show that in these circumstances fleas have often escaped incrimination.

Questions of immunity arise. Lunsford states that persons who think they are not bitten by fleas from their own dogs, actually may have been bitten until they have established an immunity. If a person continues to be bitten he undergoes a natural desensitization to the antigen deposited by the flea and this takes place gradually over a period of about a year. This is an interesting aspect of the subject and might be pursued further; it is, however, not of much interest to those seeking relief from a flea plague. Lunsford mentions various repellents and records the results of experiments with them. He concludes that the most practical method of controlling fleas is by means of the newer insecticides, such as DDT. Carpets, floors, stuffed chairs and basements should be sprayed. The spraying of kennels or of the sleeping place of animals every two months will, he holds, keep the animals free from fleas. Oil of citronella, pyrethrum, "Army 612", petrolatum and camphor, as well as DDT, are of value applied locally. It is said that sprigs of mint between the sheets will keep beds free from fleas. Lunsford refers to the view that thiamine hydrochloride taken by mouth is of value as a repellent. He describes some experiments with thiamine and cannot determine whether desensitization took place or whether the thiamine did act as a repellent. This is an interesting subject and one on which further work is needed. Lunsford makes a plea for further studies and better antigens. From the practical point of view it is the breeding places of the fleas which must be attacked.

[1] *Archives of Dermatology and Syphilology*, December, 1949.

ALFRED HOSPITAL CLINICAL REPORTS.

THE first volume of the *Alfred Hospital Clinical Reports* has been published; its object is to record some of the work being done in the wards and laboratories of the institution. The book is a royal octavo volume of 164 pages; it is printed on art paper and contains some well reproduced photomicrographs and other illustrations.

The Alfred Hospital, Melbourne, has developed its own tradition, and appropriately Balcombe Quick has written the opening article on "The Alfred Hospital Clinical School". He begins with the adoption of the hospital's constitution on October 14, 1870. In this document provision was made for the appointment of clinical clerks or dressers. In 1880 the hospital was "admitted by the Council of the University of Melbourne as a University Hospital". The clinical school was finally opened in March, 1888. Many well-known names are connected with the hospital. E. L. Gault, who received his training there as a student and who became resident medical officer after his qualification in 1888, is still on the staff as consulting ophthalmologist. John Cooke, who resigned in 1912, and Henry O'Hara, who resigned in 1913, belonged to the old school of surgeons. Hamilton Russell had been with Lister and carried on the Listerian tradition. He and his work are remembered by many medical graduates today. Among others mentioned by Balcombe Quick are the late A. V. M. Anderson, the late J. F. Mackeddie and A. F. Maclure. Three papers are reprinted from other journals—"A New Mycobacterial Infection in Man" (P. MacCallum, J. C. Tolhurst, G. Buckle and H. A. Sissons); "Organic Nervous Disease and Mental Mechanisms" (L. B. Cox); "Hæmochromatosis" (W. E. King and E. Downie). R. A. Willis contributes a survey of tumour research. The remaining articles represent observations made within the hospital. For example, P. Fantl discusses the mechanism of blood coagulation; M. D. Silberberg, H. B. Kay and G. G. Harkness deal with the use of ethylidene dicoumerol in acute myocardial infarction; J. A. McLean writes on the treatment of acute leuchæmia by folic acid antagonists; J. Eric Clarke deals with pulmonary amœbiasis and R. S. Lawson with strangulated hernia.

In drawing attention to this new publication we wish to congratulate Dr. J. E. Clarke, the editor, on the success of his efforts.

Abstracts from Medical Literature.

RADIOLOGY.

The X-Ray Appearance of Ossifying Fibroma of Bone.

R. S. Sherman and W. C. A. Sternbergh (*Radiology*, May, 1948) report twelve cases of ossifying fibroma of bone; six involved the maxilla, five the mandible and one the temporal bone. The clinical and radiographic features are believed to be sufficiently distinct to warrant acceptance of ossifying fibroma as a separate entity. The radiological findings are usually suggestive of the diagnosis and in certain instances may be characteristic. The picture is that of a unilocular lesion, in most cases limited to the maxilla or mandible, oval to spherical in shape, with a distinct boundary, usually of an egg-shell character. In the lower jaw the origin is from the medullary portion of the bone; in the upper jaw the tumour arises in similar fashion or subperiosteally. In its early phase the process is predominantly osteolytic, with little or no internal architecture and no periosteal reaction. Enlargement is progressive, with an increased productive element brought about in the maxilla by the formation of spherical densities in the mandible by irregular striæ. A rather unique growth change in the maxilla is the dissolution of adjacent bone without pressure displacement. A brief discussion of clinical, pathological and treatment aspects, particularly as they bear on X-ray diagnosis, has been included.

Calcification in Intraspinal Meningiomata.

G. J. Culver, J. P. Concannon and E. C. Koenig (*American Journal of Roentgenology*, August, 1949) state that although abnormal calcification of the skull has long been of value to the radiologist in the diagnosis of intracranial neoplasms, it has rarely been helpful in the diagnosis of intraspinal tumours. Chief interest in the diagnosis of intraspinal tumours has been centred on erosion of the pedicles, increase in interpedicular distance, and changes in the intervertebral foramina, little attention being given to calcification within the vertebral canal. Calcification within spinal cord meningiomata is of three general types. The formation of numerous psammoma bodies results in a homogenous increase in the density of the tumour, so that on the radiograph the tumour is visible only as an ovoid area of increased density. This type of calcification is rarely visible in the antero-posterior projection, but is discernible in the lateral projection of the spine. When the psammoma bodies are particularly abundant, numerous flecks of calcium are visible on the radiograph. If the psammoma bodies fuse to form calcium spicules, or actual osteoblastic activity takes place to form bone, a sharp, discrete, irregular mass of calcification may be seen on the antero-posterior and lateral radiographs. There are probably several reasons why calcification in intraspinal meningiomata is not recognized more frequently on radiographs, in spite of the fact that a high percentage are known to contain some calcium. They are as follows. (i) The calcification frequently is not seen as a definite mass, but only as an area of slightly increased density because of the fine psammomatous type of calcification. The lateral views of the spine are frequently not scrutinized carefully enough for such minor changes. (ii) In other tumours the calcification is not sufficient to be visible, regardless of quality of radiograph or interpretation. (iii) The shadows of ribs superimposed upon the vertebral canal of the dorsal and upper lumbar vertebræ make visualization of small areas of increased density difficult. (iv) There is technical difficulty in obtaining adequate lateral views of the upper three to four dorsal vertebræ, where so many meningiomata occur. Tomography may be of some value for better visualization of this region in cases of suspected spinal cord tumours.

Relationship of the Upper Cervical Vertebræ.

L. W. Paul and W. W. Moir (*American Journal of Roentgenology*, October, 1949) state that in antero-posterior radiographs of the upper cervical part of the spine an apparent lateral shift of the atlas on the axis is frequently encountered. In a group of 25 normal individuals, nine showed some degree of lateral asymmetry between these two vertebræ. Investigation of other normal persons showed that in some a distinct lateral motion of the atlas on the axis could be demonstrated on lateral flexion of the head or by forceful pressure by an examiner against muscular resistance on the part of the subject. In the absence of other radiological evidence, no diagnostic significance can be attached to such a finding. There are several possible causes of the lateral asymmetry. Variations in shape of the two lateral masses of the atlas are possible. This might explain the apparent difference in alignment of the facet surfaces on the two sides in any one position of the head. It seems more likely that in the majority of the cases a slight relaxation or redundancy of the supporting ligamentous structures is present allowing a certain amount of lateral "play" between the vertebræ. This was borne out in studies of several subjects who had shown considerable lateral motion in frontal radiographs. Lateral views were obtained with the head in a neutral position, in maximum flexion and in maximum extension. In some, but not in all, a definite widening of the space between the dens and the anterior arch of the atlas could be produced.

Reticulo-Endotheliosis.

William S. Wallace (*American Journal of Roentgenology*, August, 1949) states that it is highly probable that there is one pathological condition of reticulo-endothelial hyperplasia, its findings modified by the age of the individual, organ or area of deposit of hyperplastic cells, and by some other factor of repair as obscure as the factor causing original reticulo-endothelial hyperplasia. Reticulo-endotheliosis may assume an acute, fatal, non-lipoid form, in infants and young children, known as Letterer-Siwe disease. In older children and adults, the less acute disease is characterized by lipoid deposit and corresponds in every respect with what has been described as Hand-Schüller-Christian disease. At any stage of its course, Hand-Schüller-Christian disease may assume a subacute fatal character. Evidence is presented that so-called eosinophilic granuloma is a variant form of reticulo-endotheliosis, with a usual solitary bone lesion, eosinophilia in the areas of reticulo-endothelial proliferation, and probably widespread soft-tissue involvement. It seems highly logical to suggest that cholesterol deposit, with production of foam cells which become immobilized reservoirs, is a reparative attempt on the part of the organism as a whole to counteract the unbridled production of reticulo-endothelial cells. The immobilized reservoirs frequently are located in areas not too significant or important to the physiology of the individual as a whole. Along this line, in Letterer-Siwe disease, the power to immobilize these hyperplastic cells by lipoid deposit within them would seem to be lacking in the very young. Conversely, for some unknown reason, probably fatigue, this reparative ability is lost, and generalized involvement and infiltration of vital systems follow rapidly, with unfavourable results. Similarly, in cases of Hand-Schüller-Christian disease which are not fatal, this reparative process of cholesterol storage and immobilization of reticulo-endothelial cells may continue so long as the reticulo-endothelial system is stimulated to hyperactivity—once the hyperplasia stops, the cholesterol is absorbed and the deflated cells are replaced by fibrous tissue.

Active Bronchopulmonary Lithiasis.

Eugene Freedman and James H. Billings (*Radiology*, August, 1949) report seven cases of active bronchopulmonary lithiasis, of which six were proved at operation and subsequent pathological examination, while in the seventh the stones were expectorated. Active bronchopulmonary lithiasis is supposedly a rare clinical syndrome, but probably occurs more often than is suspected clinically. It should be included in the differential diagnosis of every case of bronchial obstruction, pulmonary suppuration and hæmorrhage associated with paroxysmal attacks of cough, when the chest radiograph shows calcific shadows in the region of consolidated areas. Broncholiths may develop within the bronchi, or they may originate outside the bronchi, with subsequent perforation into the air passages. In the majority of cases broncholiths are due to perforation of calcified tuberculous lymph glands. The X-ray changes found in broncholiths may simulate carcinoma of the lung, chronic lung abscess, bronchiectasis with atelectasis and chronic pneumonitis, as well as fungoid disease. Laminography is an important diagnostic aid in bronchopulmonary lithiasis, as it may demonstrate the stone perforating the bronchial wall or lying in the lumen of the bronchus. Early recognition and treatment of this condition may prevent the serious complications caused by bronchial obstruction, pulmonary suppuration and hæmorrhage.

Generalized Progressive Scleroderma.

G. S. Schwarz and O. K. Skinsnes (*American Journal of Roentgenology*, September, 1949) report the radiological and necropsy findings in an instance of lower œsophageal stricture associated with digital lesions and diagnosed as œsophageal scleroderma. They state that during the past few years it has

become increasingly evident that running through the varied clinical and pathological pattern of generalized progressive scleroderma lies a basic sclerosing change in the connective tissue of as yet unknown ætiology. Together with the knowledge that the varied symptomatology is to a large extent based on the localization of the process and its severity, greater attention has been focused on the œsophagus, as well as on other portions of the alimentary system, as a not infrequent site of severe change. The increasing severity of these changes in the distal portion of the œsophagus lends support to the suggestion that these changes may be largely secondary to a primary disturbance of œsophageal function leading to regurgitation of gastric contents with a resultant peptic œsophagitis and gross anatomical changes. In view of the widespread tendency toward fibrosis evinced by this disease process, it may be that the marked œsophageal sclerosis represents an exaggerated response to the chronic trauma of regurgitation, or on the other hand, the œsophagitis may serve to provide a *locus minoris resistentiæ* allowing increased local activity of whatever ætiological agent is involved.

PHYSICAL THERAPY.

Malignant Degeneration of Benign Giant-Cell Tumour of Bone.

T. LEUCUTIA AND JAMES C. COOK (*American Journal of Radiology*, November, 1949) describe an investigation intended to discover, if possible, the factors leading to malignant degeneration of giant-cell tumours and to determine if this is increased by irradiation. They state that it is well known that malignant change can follow gross overdose of deep X-ray therapy, but they are concerned only with cases in which customary doses and technique are used. The study is based on 77 patients treated between 1923 and 1947. From 1923 to 1929, the method of treatment consisted of curettage and post-operative X-ray therapy. Since 1930 X-ray therapy has been the principal method. Of the total number of patients, seven showed evidence of malignant degeneration. Analysis of the four cases in which malignant degeneration occurred following X-ray therapy to a benign lesion reveals that in one case the sarcomatous change was observed during the course of treatment, and in a second case the dose given was so small (about 150r applied to the skin twice at intervals of two months) that the effect would be negligible. The question of spontaneous malignant degeneration in benign giant cell tumours is discussed with examples from other authors. It is pointed out that there are two schools of thought. The first holds that the tumours are malignant from the beginning, but may remain inactive and then all at once change to a malignant course. The second view is that a malignant change occurs in a benign giant-cell tumour, as may occur in fibromata, myxomata *et cetera*. The authors state that there is a good deal of literature discussing the question of the onset of malignant change following surgery in benign giant-cell tumours of bone. Simmons reported a series of 116 patients with apparently benign tumours, of whom six later died from metastases. The authors summarize their findings by stating that malignant change resulted spontaneously after repeated surgery and irradiation, after irradiation alone, and after surgery alone, when bone chips were used to fill the cavity. It is concluded that malignant change occurs in a limited number of cases of giant-cell tumour (10% to 15%) as a natural sequence of events unaffected by the type of treatment given.

Nitrogen Mustard (HN_2) as a Systemic Adjunct to Radiation Therapy.

B. BOSWIT AND G. KAPLAN (*American Journal of Roentgenology and Radium Therapy*, May, 1949) discuss the value of nitrogen mustard (HN_2) in treatment in a series of 87 cases, principally of Hodgkin's disease, lymphosarcoma, chronic leuchæmia and bronchogenic carcinoma. They point out that HN_2 is a systemic toxin with special selectivity for the blood-forming organs, the gastro-intestinal tract and proliferating tissues. For the blood-forming organs, this drug is a cumulative potent toxin, inducing progressive hypoplasia of the bone marrow with repeated therapeutic courses. Another important toxic effect of nitrogen mustard is testicular atrophy. The authors emphasize the fact that HN_2 is not a cure for any malignant disease. Its effect is purely palliative, and this effect may be principally observed in the malignant lymphomata. It should not be employed for early localized Hodgkin's disease or lymphosarcoma. For these patients the best chance of survival comes from rigorous local X-ray therapy. The authors are also of the opinion that HN_2 is not a substitute for X-ray therapy in early generalized lymphosarcomata when still sensitive to irradiation. Local radiation therapy causes far less injury to the bone marrow than nitrogen mustard, and in addition the testes can be adequately shielded. However, it is believed that nitrogen mustard is a very useful adjunct in the treatment of advanced generalized malignant lymphomata when irradiation becomes ineffective or contraindicated. It is also of value in the treatment of cases of inoperable bronchogenic carcinoma which have proved to be radio-resistant. Favourable remissions lasting up to many weeks may occur in these cases, and there may be relief from cough, dyspnœa and pain, and evidence of regression of atelectasis and superior *vena cava* compression. With other malignant lesions, HN_2 is apparently ineffective.

Hodgkin's Disease.

P. SAHYOUN AND S. J. EISENBERG (*American Journal of Roentgenology*, March, 1949) set out to present a classification of Hodgkin's disease (excluding Hodgkin's sarcoma) based on a correlation between histological appearances and clinical course. Three types are recognized: (i) a compactly cellular type in which the condition is slowly progressive and the range of life expectation is from 48 to 160 months; (ii) a fibro-granulomatous type in which the condition is moderately progressive and the range of maximum life expectation is 20 to 60 months; (iii) a loosely cellular type in which the condition is rapidly progressive and the range of maximum life expectation is 12 to 20 months. A series of 24 cases was studied, and 19 were followed sufficiently long to determine the clinical course. Of these 17 conformed to the histological prognosis. The authors state that in the first group (the compactly cellular type) the compact structure of the tumour with slight fibrosis is characteristic. Conditions of this type reacted favourably to deep X-ray therapy, and the prognosis was relatively favourable. In the second group (the fibro-granulomatous type) the typical picture of Hodgkin's granuloma is seen—proliferation of reticulo-endothelial cells, Sternberg-Reed cells and pleomorphism. There is a tendency to fibrosis and necrosis. In this group initially good results are often obtained from deep X-ray therapy, but there is a gradua. decrease in radiosensitivity, as recurrences take place. In the third group (the loosely cellular type) the architecture of the node is completely destroyed and replaced by sheets of loose reticulo-endothelial cells. There is a diffuse pleomorphic picture of eosinophile cells, plasma cells and lymphocytes. The capsule may be invaded, and the tumour is very vascular. Response to deep X-ray therapy in this type may occur, but there is usually rapid recurrence within a few weeks or months. In some cases, no improvement at all will occur after irradiation and the patient goes downhill rapidly. The case histories of all patients followed are given with details of their clinical condition and treatment.

MEDICINE.

The Diversity of Gouty Arthritis and its Complications.

JOHN H. TABBOTT (*Annals of Internal Medicine*, October, 1949), from the study of eight patients with gout, illustrates the diversity of gouty arthritis and its complications. He states that the onset of symptoms, that is, the first attack of gouty arthritis, may appear in the first decade of life or as late as the eighth decade. At the time of the first attack, evidence of osseous change on X-ray examination of subcutaneous tophi is generally found to be lacking. The passage of urate stones or urate gravel may precede the first attack of gouty arthritis. Urate stones may be passed by persons who do not develop gouty arthritis subsequently. Renal disease is the most important non-arthritic phase of gout, and there appears to be close correlation between renal involvement and joint involvement. The pathological findings in the kidneys of gouty patients are a mixture of several entities. Rheumatoid arthritis and gout may be observed in the same patient. Each disease must be treated independently. This may be done without aggravating either condition. Colchicine, 0·5 milligramme per hour, is recommended for the acute attacks, and this dosage should be maintained until the onset of gastro-intestinal distress. From 10 to 14 doses are usually sufficient; then colchicine administration is stopped, and *Tinctura Opii Camphorata* is given. Between attacks, some colchicine is recommended. For patients with frequent attacks of arthritis, one or two colchicine tablets each day is advised. In less severe cases the patient may require only one or two tablets per week. A balanced diet with a liberal fluid intake seems to produce as satisfactory results in many cases as does rigid dieting.

British Medical Association News.

SCIENTIFIC.

A meeting of the New South Wales Branch of the British Medical Association was held at the Saint George Hospital, Kogarah, New South Wales, on December 1, 1949. The meeting took the form of a number of clinical demonstrations by the members of the honorary medical and surgical staffs of the hospital. Part of this report appeared in the issue of April 22, 1950.

Pelvic Abscess Simulating Carcinoma of the Sigmoid Colon.

Dr. T. E. Wilson showed a man, aged seventy-nine years, who had been admitted to hospital on September 10, 1949, complaining of generalized abdominal pain for seven days. When the pain commenced he had had an attack of diarrhœa, but his bowels had not been opened for three days prior to admission. He gave a history of a similar but less severe attack of pain twelve months earlier. Examination revealed that his general condition was good for his age. His abdomen was distended, but no mass or viscus was palpable. Increased bowel sounds were audible. On rectal examination a hard mass was palpable in the recto-vesical pouch. This was fixed in position, and it appeared to be typical of a carcinoma of the sigmoid colon which had fallen down into the pelvis and had become adherent to the rectum in that position. Through a lower left muscle-cutting incision the mass in the recto-vesical pouch was displayed and was found to be an abscess complicating diverticulitis of the sigmoid colon. The pus was aspirated and the abscess drained by means of a tube inserted through the lower end of the wound. For the first five days after drainage of the abscess the patient's temperature was up to 101° F., but thereafter it was within normal limits. The tube was removed on the second day after operation, but it was five weeks before the discharge eventually ceased.

Severed Flexor Tendons.

Dr. Wilson then showed a man, aged twenty-five years, who on July 18, 1949, had fallen onto a milk bottle, which he was holding in his hand. The milk bottle broke and produced a laceration across the palm of the hand, which included all the tendons, nerves and vessels at the level of the distal crease. With the patient under general anæsthesia the tendons of the *flexor digitorum profundus* were repaired with double right-angle sutures of stainless steel wire. The ends of the tendons of the *flexor digitorum sublimis* were pulled down and excised. The digital nerves were repaired with fine stainless-steel wire. The skin was sutured, and then a plaster of Paris cast was applied to immobilize the fingers and wrist. Penicillin injections were given for six days. The plaster splint was removed on August 2, 1949, and the patient was then encouraged to use his fingers and hand, but no physiotherapy or passive movement was employed until September 13, 1949; by that time he had about half the normal range of movement of the fingers. Since then there had been a steady improvement, and at the time of the meeting he had almost complete range of movement in the fingers.

Recurrent Strangulation of Small Bowel.

Dr. Wilson's last patient, a woman, aged twenty-three years, had been admitted to hospital on November 27, 1948, because of sudden, severe, colicky, abdominal pain early that morning. The pain had persisted and she had vomited once. Her bowels had not been opened for twenty-four hours. She stated that the pain was exactly the same as she had had thirteen months previously and that she was sure that she now had the same condition as then. On that occasion she had suffered from intestinal obstruction and strangulation due to intestinal adhesions; and resection of portion of the small bowel had been performed. At the time of the second admission she was five months pregnant. On examination of the patient the abdomen was found to be enlarged owing mainly to the enlargement of the uterus, which extended to within three inches of the umbilicus, and there was a soft, tender mass in the epigastrium. There was no dulness in the flanks, the intestinal sounds were not increased, and no peristaltic waves were visible. The pulse rate was 120 per minute. At operation two feet of the terminal part of the ileum were found to be kinked and strangulated by intestinal adhesions. The adhesions were divided, and the gangrenous loop of the bowel was excised. An end-to-end anastomosis was performed, the anastomosis being situated six inches from the caecum. After the operation a Wangensteen suction apparatus was set up, and fluids were given intravenously for forty-eight hours. Apart from slight tachycardia for the first week, convalescence was uneventful and the patient was discharged from hospital to her home on the twelfth day after operation. Dr. Wilson remarked that the main point of interest was that the patient herself was able to make the diagnosis. He considered that the palpable tender mass in the epigastrium was a gangrenous loop of bowel, but was not so certain as she was.

Prolapsus Uteri.

Dr. Charles V. Salisbury showed a series of patients to illustrate the various degrees of *prolapsus uteri*. He stated that before the cure of the condition was discussed it was essential to be familiar with the structures that supported the uterus and vagina in their normal position. The principle of operative cure was to restore the uterus and vagina to their correct anatomical position by utilizing their normal supporting structures. All the patients shown had lax pelvic floors with various degrees of tearing and separation of the pubo-coccygeal fibres of the *levatores ani* muscles. In three, the cardinal ligaments, the pubo-cervical fascia and the fascia lying between the posterior vaginal wall and the rectum had stretched to such a degree as to permit the uterus to descend completely through the introitus. In selection of the best operative procedure in each case the following important factors had to be taken into consideration: (i) the age and general physical condition of the patient; (ii) the degree of the prolapse; (iii) the condition of the cervix; (iv) the desirability of preserving the child-bearing function.

The first patient was a married woman, aged seventy years, suffering from a complete prolapse. Palliative measures were considered the correct form of treatment, as the age and general physical condition of the patient contraindicated surgical treatment. The fitting of a cup-and-stem pessary was then demonstrated on the patient.

The second patient, who was aged sixty-eight years, was also suffering from a complete prolapse with ulceration of the cervix. Her physical condition was good, and it was proposed to perform vaginal hysterectomy and repair of the perineal floor. That procedure was selected as there was no elongation of the cervix, and the ulcerative condition made it desirable to remove the uterus.

For the remaining three patients, who were aged forty, forty and sixty years respectively, it was proposed to perform the Manchester operation. Dr. Salisbury stated that if that operation was properly performed, the uterus and the adjacent structures were restored to approximately normal position and all the genital functions were preserved. It was the operation of choice in most cases of *prolapsus uteri*.

Dermatological Conditions.

Dr. B. Fisher presented a female patient, aged fifty-eight years, with a history of varicose veins present for over twenty years. About twelve months before the meeting an ulcer had developed on the medial aspect of the left leg. At first it responded to various forms of treatment, and then ceased to do so, and the patient sought treatment at the Saint George Hospital in September, 1949. It was found that she had a large ulcer two and a half inches wide and two and three-quarter inches long on the medial aspect of the lower third of the leg, with raised edges surrounding a deep ulceration. The ulcer had a greyish, sloughing base, and was evil-smelling. The surrounding skin was red, swollen and tender, covered with scales and partly weeping. A mixed culture of streptococci and staphylococci was grown from the ulcer. The results of Wassermann and Kahn tests were negative. The condition was diagnosed as an indolent ulcer with surrounding varicose eczema. Treatment given consisted of compresses of 4% boric acid in water and of the administration of ultra-violet rays in a half-erythema dose twice a week. At the time of the meeting remnants of the ulcer were still present; it measured three-quarters of an inch in diameter and one and a half inches in length, and its base appeared clean, with multiple minute bleeding points in granulation tissue. The surrounding skin was free of eczema. Tenderness was completely gone, and according to the patient's statement, the symptoms of pain and discomfort had subsided after about four weeks of treatment.

Dr. Fisher then presented a girl, aged eleven years, who had had warts (*verruca vulgaris*) on the dorsum of both hands and the fingers for four years. When examined she had 27 warts on the back of the right hand and extensor surfaces of the fingers, and 24 on corresponding areas of the left hand. Several forms of treatment had been tried, including salicylic acid, one gramme to one ounce of *collodium flexile*, applied daily for two weeks, and later 25%

tincture of podophyllum. It was then decided to cauterize some of the larger warts, but they grew again within six weeks. Finally carbon dioxide snow was applied to some of the larger warts. As all these treatments were unsuccessful over a period of six months, it was decided to use X-ray therapy. Three treatments were given at intervals of one week, each with a dosage of 200r given through a half-millimetre aluminium filter. One month after the last treatment many of the small warts had completely disappeared, the larger warts appeared to have decreased in size and all were flattened and slightly red. At the time of the meeting only multiple, small, flat, spot-like areas remained. Dr. Fisher considered that X-ray therapy was the most effective form of treatment for such extensive virus infections.

Dr. Fisher's third patient, a girl, aged eighteen years, had a history of severe dandruff starting about one year after the onset of menstruation at the age of fifteen years. Menstruation had always been irregular and painful, and the patient had noticed that her scalp condition appeared to be much worse before the onset of the menstrual period. During the past two years severe seborrhoeic dermatitis had developed about the ears, forehead, back, chest and neck, followed by nearly complete loss of hair. Wet dressings of 4% boric acid solution were applied during the weeping phase of the dermatitis, and when it became dry a cream was used consisting of 1% of salicylic acid, *Liquor Picis Carbonis* and *Sulphur Præcipitatum* in a "Lanette Wax" base. The patient seemed to respond to the treatment, but the condition relapsed, and it was decided to apply X-ray therapy, three doses, each of 130r, being given at weekly intervals to all the affected areas. In addition large doses of "Potantol" were given. Within four months from the last X-ray treatment all the scales had disappeared, and two months later the normal beginning of regrowth of hair was visible on all bald areas of the scalp. At the time of the meeting, five months after the X-ray therapy, all the affected areas on the scalp were covered with normal thick hair about one to one and a half inches long. During the preceding three months the patient had used a scalp lotion consisting of *Liquor Picis Carbonis*, salicylic acid and *Sulphur Præcipitatum* in equal parts of rectified spirits. Dr. Fisher commented that the condition was one of many with a similar history, in which the lack of success was due to over-treatment, and that was responsible for the development of the eczema. In such cases only mild and simple treatments were successful.

Correspondence.

POLIOMYELITIS AND ROUTINE TONSIL AND ADENOID OPERATIONS.

SIR: Dr. Carruthers will find in THE MEDICAL JOURNAL OF AUSTRALIA, April 19, 1941, an answer to at least one of the questions which he asks in his letter in THE MEDICAL JOURNAL OF AUSTRALIA, February 25, 1950. In an article on the 1937-1938 epidemic of poliomyelitis in New South Wales, which I wrote when I was medical officer to the Consultative Council on Infantile Paralysis, I discussed the question of an attack of this disease following tonsil and adenoid operations, and reviewed the literature on the subject.

Below is a table extracted from this article which shows the high percentage of cases of the bulbar type occurring five to twenty-five days after tonsil and adenoid operations taken from the literature up to 1941.

Sabin injected poliomyelitis virus into the tonsillar region of 20 monkeys. Poliomyelitis developed in 16. In 13 instances the disease was of the bulbar type.

The literature since 1941 has confirmed the finding that the percentage of the bulbar form in cases of poliomyelitis following five to thirty days after tonsil and adenoid operations is in the region of 70 to 80. The percentage of the bulbar form among all cases in epidemics of poliomyelitis varies, but is generally about 11 to 15.

The evidence supports the contention that the incidence of the bulbar form is greater if poliomyelitis develops within five to thirty days after tonsil and adenoid operations than it is among patients who have not had recent operations on the nose and throat.

In 1941 Krill and Toomey reported bulbar poliomyelitis following tonsillectomy and adenoidectomy in five children of one family (K.). The operations were done on the same day. The disease developed within fourteen days. Three of the children died. Detailed investigations were carried out as to the possible source of infection. The sixth and youngest child of the K. family did not undergo the operation, and remained well, although virus was present in the stool. Virus was recovered from the stools of two cousins with whom two of the K. children had lived a month earlier. The evidence suggested that the virus was acquired by the K. children during this visit. Four children in another family with whom the K. children had subsequently lived were found to be carrying the virus without exhibiting any signs of poliomyelitis. The authors conclude: "It is clear that the operative procedure was the factor precipitating the severe bulbar form of poliomyelitis in children who otherwise would probably have escaped with unapparent infections."

The exact effect of recent tonsillectomy on the incidence of poliomyelitis cannot be determined quickly or easily. The period of investigation needed to obtain conclusive figures for New South Wales would, in my opinion, be nearer twenty years than the five-year period which Dr. Carruthers suggests. The literature appears to indicate that not more than a small minority of cases would be prevented if operations on the nose and throat were discontinued during the months when poliomyelitis is prevalent. The incidence of the disease is low—strikingly lower than other infectious diseases, and even in an epidemic period seldom attacks more than 1 in 1000 in a city with over

TABLE I.

The Number of Cases Reported in the Literature Occurring Five to Twenty-Five Days after Tonsillectomy or Adenoidectomy.

Source.	Cases.	Bulbar Type.
Ayer (1928)	9	9
Aycock and Luther (1929)	16	11
Silverman (1931)	5	4
Fischer and Stillerman (1937)	10	5
Anderson and Dixon (1938)	2	2
Eley and Flake (1938)	20	17
Stillerman and Fischer (1938)	3	3
Aycock (1938)	2	2
Ayer (1938)	6	6
Koskoff, Amshel and Lebeau (1939)	2	2
1937-1938 epidemic, New South Wales	7	5
Total	82	66 (80%)

100,000 inhabitants. The incidence of cases with paralysis in children under fifteen years in the 1937-1938 epidemic in New South Wales was 0·6 per 1000 of population. Anderson found that the incidence in recently tonsillectomized children was 2·6 times greater than in the general child population. In his series of 232 cases seventeen had had tonsillectomy performed within thirty days of the development of the disease. In the 1937-1938 epidemic of poliomyelitis in New South Wales, seven of 711 patients are known to have had tonsillectomy seven to thirty days prior to the onset of their illness. Information on this point could not be obtained in a small, but now unknown, number of cases. Even assuming that tonsillectomy was the precipitating factor in these seven cases, the percentage of cases affected by this operation was only 1 in this epidemic. The small number of cases following tonsillectomy may have been due to the mildness of the 1937-1938 epidemic. The fatality rate was only 2·5%, whereas the rate most often reported ranges between 8% and 12%. It has been found in experimental poliomyelitis that a virus of low virulence may destroy a small proportion of cells in the central nervous system without producing paralysis or other evidence of clinical disease. During a mild epidemic, therefore, it is probable that a proportion of the cases of the disease which develop after tonsillectomy will be of the abortive type, whereas in a severe epidemic the virus would destroy a larger number of cells, and symptoms of bulbar paralysis would ensue in a greater number of cases.

The figures given above suggest that many tonsillectomies might be done during an epidemic without the subsequent development of clinical poliomyelitis, but almost every series of reported cases of poliomyelitis includes a small number, with some deaths, following within thirty days of tonsillectomy and adenoidectomy.

All the evidence suggests (i) that the risk of clinical infection may be increased to a very small extent by recent operations on the nose and throat, and (ii) that the same operations greatly increase the likelihood that the disease, if it should develop, will assume the bulbar form.

I agree with W. L. Aycock when he says: "The risk of bulbar poliomyelitis following tonsillectomy most of the time in most places is almost nil, but for short periods of time in a few places (epidemics of poliomyelitis) it is a risk to be avoided if it can be done without inviting some more serious danger to health, and whether or not it interferes with the convenience of the patient, the family, the hospital or the doctor."

Yours, etc.,

Sydney, KAREN HELMS.
April 14, 1950.

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FINAL RESULTS OF LONG-TERM THERAPY WITH METHYL THIOURACIL IN THYREOTOXICOSIS.

SIR: I am indebted to Dr. F. F. Rundle for his complimentary remarks on the results published by me in the treatment of thyreotoxicosis with methyl thiouracil. However, there are two points mentioned by him on which I would like to comment in order to clear any misapprehension.

Firstly, as regards his remark "surgical management, provided it is expert, still offers the more practical, expeditious and sure method of controlling hyperthyreoidism in the great majority of patients". The acute primary thyreotoxic cases are the ones most suitable for long-term therapy with methyl thiouracil, and in such cases no experienced surgeon can hope to restore by operation more than 85% to physical and economic normality; there is always a proportion in which some trace of their thyreotoxicosis persists, such as prominent eyes, an unstable nervous system *et cetera*. Even in the best hands there is a certain morbidity as a direct result of operation, and some cases develop a recurrence of their thyreotoxicosis. Hypothyreoidism does not matter as it is readily controllable. It takes years of experience to achieve a mortality rate of under 1%. With the "thio" compounds there is no paralysis of one or both vocal cords, no tetany, and both mortality and morbidity rates are practically negligible now that we know how to use these compounds correctly. Return to complete normality is achieved in 64% of cases; 34% show complete control of thyreotoxicosis, but have some reminder of having had it. In only 2% was treatment abandoned. Because recurrence of symptoms occurred in 4·5% of cases and it was found to be only in those with a persistently enlarged thyreoid, these patients are now advised operation when it is evident that resolution will not occur. The operation can be carried out as one of convenience without risk, technical difficulty or reaction, and the total stay in hospital is only eight or ten days.

I have stressed in all my writings that thyreotoxicosis secondary to an adenomatous or old colloid goitre should always be submitted to operation when toxicity has been controlled by short-term therapy, provided the patient is otherwise fit for surgery.

The second point is in regard to the dosage of methyl thiouracil, as Dr. Rundle states I appear to advise 600 milligrammes daily to control hyperthyreoidism. I thought I had made it clear that the initial dosage is 300 milligrammes daily, or less in mild cases. After seven to ten days this dosage is doubled only until an adequate response is obtained. This usually occurs in three or four weeks, after which the dosage is halved and in a further three to four weeks is reduced to 200 milligrammes daily for another month, after which a maintenance dosage of 100 milligrammes is given.

S. L. Spencer and I pointed out some years ago that maintenance of a *minus* metabolism was necessary to secure a lasting remission of symptoms, and it is pleasing to see Geo. Crile, junior, is also advocating this measure. If there is any glandular hyperplasia it is readily controlled by giving *Thyroideum Siccum* once the adequate response has been obtained. Toxic effects with the régime outlined are now very rare and seldom interfere with continuity of treatment. With the recent series of cases treated with "Meprocil", that is, combined methyl and propyl thiouracil, I find results are more quickly obtained, complete remission more certain in a shorter period and toxic effects negligible. A report on this combination is expected to appear in this journal very shortly.

Yours, etc.,

225 Macquarie Street, HUGH R. G. POATE.
Sydney,
April 17, 1950.

RECTAL PROLAPSE.

SIR: Mr. T. E. Wilson has contributed a sound review on the subject of rectal prolapse (THE MEDICAL JOURNAL OF AUSTRALIA, April 8, 1950), but proctologists will note inaccuracies. Unfortunately the conclusions in his paper are based on impressions rather than on fact. It is especially regrettable that he should claim such good results with rectosigmoidectomy when in actual fact the staff of Saint Mark's Hospital are concerned about the high rate of recurrence that follows the operation. The Subsection of Proctology, Royal Society of Medicine, discussed the subject in London in May, 1949. Figures from Saint Mark's Hospital were produced, and they provide no support to Mr. Wilson's view that "the treatment in the majority of cases of rectal prolapse is gratifyingly successful". Amongst other things, the figures show:

1. Complete prolapse of the rectum is one of the most difficult conditions a surgeon is asked to treat.

2. Neither mental disorders nor organic diseases of the nervous system appear to be predisposing influences in its development.

3. Between 1931 and 1947 inclusive, 150 rectosigmoidectomies were performed at Saint Mark's Hospital. It was possible to trace the results of 108 operations; 65 (60%) recurred and 43 (40%) had not recurred at the time of the review. Of the latter 43 (20 of whom had been followed for three years or less), 21 were incontinent, eight very badly, after the operation. There were 15 successful rectosigmoidectomies, and in these it would be difficult to believe that a rectal operation had ever been performed. It is interesting to note that in these successful cases, the average length of bowel excised was two to four inches, whilst in the unsuccessful rectosigmoidectomy the average was eight to fourteen inches.

4. The Moschcowitz operation was performed in six instances, and in four of the five survivors the prolapse had recurred.

Complete prolapse of the rectum is uncommon, and any one surgeon sees few cases. Therefore the unique experience of the Saint Mark's surgeons is to be respected. One must not be blinded by the occasional success. It is better to know the rectum inside and out before treating one inside out.

Yours, etc.,

Royal Melbourne Hospital, E. S. R. HUGHES.
Parkville,
Melbourne.
April 8, 1950.

SOME OBSERVATIONS ON CHILDHOOD ALLERGY.

SIR: The article by S. E. L. Stening on the above topic in your issue of March 25, 1950, page 391, is noteworthy for several recorded facts, not the least significant of which is illustrated in Figures I and II, which chart the age at which patients are first seen, and the age at onset of symptoms respectively. In the light of facts revealed in a recent investigation of infantile acrodynia, it is perhaps

worth emphasizing the coincidence of these age groups with those in which it is reasonable to assume the function of the suprarenal cortex can often be subnormal, owing to developmental reconstruction of the post-natal suprarenal gland.

Because this gland occupies a key position in vegetative adjustment to changes in both the internal and external environment, it might well be that many cellular responses attributed to allergy are indications of defective vegetative regulation. My colleague, Dr. Donald Cheek, in a paper read to a staff meeting at the Children's Hospital, cited the not infrequent association with pink disease of allergic phenomena including asthma, and our subsequent investigations have disclosed the fact that as the child recovers from the "pink disease", its allergic rashes, or asthma, disappear.

Other facts listed in Dr. Stening's paper which add to the suspicion that hypofunction of the suprarenal cortex might be inculpated in many of his cases are the "perennial rhinopathy", the anorexia, and the diarrhœa and vomiting. The poor nutritional state which he reports seems also highly suggestive.

In our work on infantile acrodynia, or pink disease, attention was directed to the fact that the "pink" stage was only the apparent late phenomenon in an insidious chronic condition, and work by Dr. Cheek at present in progress in this laboratory goes far to confirm our original suspicion that the syndrome of the "nervous child" is in many, if not most, instances a result of the lowered plasma sodium in a prolonged insidious operation of the causes which in some cases terminate in pink disease. Whether the facts cited by Dr. Stening are coincidental or due to a common cause with the conditions we are studying can be established only by further research, and this letter is written with the object of provoking such a response.

Yours, etc.,

C. STANTON HICKS.

Department of Human Physiology and Pharmacology,
University of Adelaide,
Adelaide.

April 3, 1950.

Post-Graduate Work.

THE AUSTRALIAN POST-GRADUATE FEDERATION IN MEDICINE.

OVERSEAS LECTURER FOR 1950.

THE Australian Post-Graduate Federation in Medicine has pleasure in announcing that Professor Francis G. Blake, M.D., M.A., D.Sc., F.A.C.P., Sterling Professor of Medicine, Yale University School of Medicine, New Haven, Connecticut, United States of America, will visit Australia in July and August as the Federation's overseas lecturer for 1950. Professor Blake will visit all Australian States where he will deliver post-graduate lectures under the auspices of the State post-graduate committees.

Professor Blake is an outstanding lecturer, who has had a distinguished career. He is physician-in-chief to the New Haven Hospital and has been a member of the scientific directors, the Rockefeller Institute, and of the National Research Council. He has previously made a brief visit to Australia during the second World War as consultant to the Secretary of War and as president of the Board for Investigation of Epidemic Diseases in the United States Army.

Details regarding dates and lectures by Professor Blake in the various Australian States will shortly be announced by the individual State post-graduate committees.

THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

Course in Advanced Medicine.

THE Post-Graduate Committee in Medicine in the University of Sydney announces that a course in advanced medicine suitable for M.R.A.C.P. candidates will be conducted for a period of fifteen weeks from May 29 to September 8, 1950. Fees for attendance will be £39 7s. 6d., or £2 12s. 6d. per week. The programme has been arranged to take place almost exclusively in the afternoons from approximately 2 p.m. to 5 p.m. on five days per week and will include didactic lectures on the more obscure aspects of internal medicine, designed to supplement the students' reading (these will cover the various systems in turn); lectures and tutorials in electrocardiography; ward rounds and demonstrations of cases at the principal metropolitan hospitals approximately twice weekly; regular clinico-pathological conferences; demonstrations of the *fundus oculi*; lecture-demonstrations in physiology and biochemistry and discussions on applied physiology; lecture-demonstrations in pathology and hæmatology; demonstrations of the application of radiological methods of diagnosis to medical diseases, and demonstrations of psychiatric cases. The supervisor of the course will conduct tutorials on selected subjects and students may discuss with him any problem arising in the course of their work.

It is expected that candidates will devote a considerable time to general reading, both of text-books and of current medical literature. The object of the course is to provide assistance and guidance for the serious students of internal medicine. It is desirable that students should have had considerable clinical experience in hospital and/or in medical practice before considering themselves prepared to take examinations for higher medical degrees or diplomas.

Fees are payable in advance at enrolment date, and applications to attend the whole or portion of this course should be in the hands of the Course Secretary, The Post-Graduate Committee in Medicine, 131 Macquarie Street, Sydney, as early as possible.

THE MELBOURNE PERMANENT POST-GRADUATE COMMITTEE.

Course in Psychiatry.

THE Melbourne Permanent Post-Graduate Committee now has details of the subject matter of the course in psychiatry for D.P.M. candidates and psychiatrists generally, which they will conduct with the cooperation of the Australasian Association of Psychiatrists, the latter providing lecturers. This course will commence on September 11 and finish on October 6, 1950. The time is arranged for the benefit of interstate candidates. With few exceptions, the mornings will be free, and it is anticipated that they will be filled in by visits to clinics and hospitals. In addition, slides for neuropathological study will be made available at the Alfred Hospital by courtesy of Dr. Leonard Cox.

It is intended that the lectures be as far as possible in the nature of lecture-discussions, and all candidates are expected to participate. These lectures will be held at the Royal Melbourne Hospital. The case discussions will take place in various clinics and at the psychology department of the University of Melbourne. Candidates and lecturers will examine patients either in the presence of other candidates or through a two-way screen; in addition wire recordings of interviews will be played and discussed. Members of the course will be expected to participate and discuss methods of approach, interviewing technique, psychopathological mechanism, diagnosis and treatment. The discussion is expected to be in the form of constructive and destructive criticism, and in general will take the form of a case conference.

Further details concerning the course may be obtained from the Post-Graduate Committee, 426 Albert Street, East Melbourne (JM 1547). The fee for the course will be fixed about the end of May and will depend on the number of tentative entries received.

The Royal College of Obstetricians and Gynaecologists.

VICTORIAN STATE COMMITTEE.

POST-GRADUATE LECTURES.

A SERIES of six lectures of special interest to general practitioners, arranged by the Victorian State Committee of the Royal College of Obstetricians and Gynæcologists, will be given in the College Hall, 122 Flinders Street, Melbourne, at 8.15 p.m. on alternate Wednesdays, commencing July 5, 1950. The fee for the course is two guineas, or 10s. 6d. for individual lectures, payable to the College or on admission. Details of the lectures are as follows: "The Use and Abuse of Obstetric Forceps", W. Ivon Hayes, M.D.; "Abnormal Uterine Bleeding", R. G. Worcester, M.D., F.R.C.S., F.R.A.C.S.,

F.R.C.O.G.; "The Problem to the General Practitioner of the Premature Infant", W. D. Refshauge, M.R.C.O.G.; "Hormone Therapy in Obstetrics and Gynæcology: Is it Worth While?", S. Lance Townsend, F.R.C.S.E., F.R.A.C.S., M.R.C.O.G.; "Pruritus and Vaginal Discharge", Frank Hayden, F.R.C.S., F.R.A.C.S., F.R.C.O.G.; "That Occipito-Posterior Position!", Donald F. Lawson, M.D., B.S., D.G.O. (Melb.), F.R.C.S., F.R.A.C.S., F.R.C.O.G.

Lectures for Membership Examination.

A complete series of lectures suitable for candidates for the membership examination of the Royal College of Obstetricians and Gynæcologists has been prepared by the Victorian State Committee, the course to commence in Melbourne on August 1, 1950. Intending candidates are invited to apply for the detailed syllabus, available from the Secretary, 122 Flinders Street, Melbourne. The fee for the course is thirty guineas.

Obituary.

GERALD WEIGALL.

Dr. Gerald Weigall died on February 22, 1950, at his home in South Yarra, Victoria. He was born in 1872 and was the third son of Theyre Weigall, Master in Equity, whose wife, Marion a'Beckett, was the daughter of the first Chief Justice of Victoria.

He attended Melbourne Grammar School from 1882 to 1887, winning several important scholarships. He was a keen member of the Old Melburnians Society, being made president in 1934, and took an active interest in the school and the society up to shortly before his death.

At the University of Melbourne he graduated as M.B., Ch.B. in 1892 with honours and was awarded the prize in surgery. When not yet twenty-one years of age he went to China as ship's surgeon before he was old enough to be registered. He was the resident medical officer at the Children's Hospital from 1892 to 1894.

He went to England in 1895-1896 and did post-graduate work. When he returned to Australia in 1897 he started practice in Cheltenham, Victoria, then a very outlying district. This was in the real "horse and buggy" days, when there was no hospital, private or public, nearer than the Alfred. Emergency operations such as those for perforated typhoid fever ulceration and other surgical procedures were performed on the kitchen table. The distance from Melbourne then was considerable, but Weigall resumed work at the Children's Hospital and held an honorary appointment there from 1897 to 1927. Old out-patient cards show him described as "Doctor", then "Surgeon", then "Physician".

In 1899 he married Maud Raleigh and had two sons and three daughters. He moved to Brighton from Cheltenham in 1909, where he practised till 1936, except for a year in 1927 when he went to England. He relinquished this practice in 1937 and from then onwards practised only in Collins Street. He always retained a great interest in his old patients and acted as adviser, guide, philosopher and friend to many right up till shortly before his death.

In 1945 Miss Gwendolene Pelletier became his second wife.

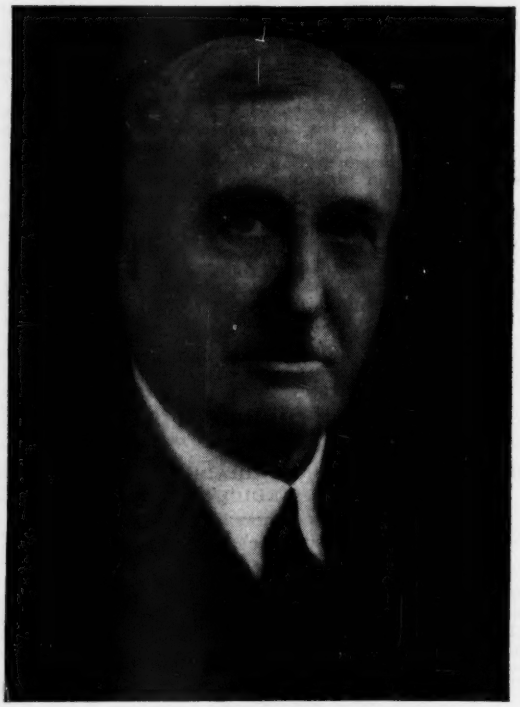
When the Duke of Gloucester visited Australia Dr. Weigall was selected by the Victorian Branch Council to attend the Duke throughout his travels in Victoria as his personal physician.

He was very interested in the welfare and high standards of the medical profession and made a point of establishing and maintaining cordial relationships among practitioners. He was very proud of the happy relationships which existed in his district.

He was the representative of the Southern Suburban Subdivision on the Victorian Branch Council and was president in 1933-1934. He was its representative on the Big Brother Movement, in which he played an important part at its inception. He was a vice-president of the Victorian Bush Nursing Association and was made a life member in 1934. He incorporated its principles in the Brighton Community Hospital, which he was largely responsible for founding at the end of his term of practice in Brighton.

The Ministering Children's League, the Graduates' Section of the University Union (of which he was president at one time) and "Stonnington" and "Kurneh" (1940-1945) were among Weigall's other interests and activities. He was very sociable and enjoyed the company of his fellow men and they enjoyed his. His speeches were appreciated. He was a member of the Melbourne Club, the Royal Melbourne Golf Club, the Wallaby Club (of which he was president in 1930), and of the Melbourne Medical Association, of which he was president in 1932. He was a regular attendant at meetings of the Victorian Branch of the British Medical Association and of the Medico-Legal Society up till the last year of his life, and generally contributed something valuable to their discussions.

He made a point of stressing the welfare of patients as a first consideration and was interested more in the practical than the scientific aspects of disease. He was often heard to tell students and younger graduates to treat the patient rather than only the disease, as well as giving practical advice on how to do this. He set a high standard and example of the duty of a doctor to his patients. His main personal interests were out-of-doors—golf, gardening, walking with the "Wallabies"—and it was a great deprivation when his failing strength during his illnesses of the last few years prevented him from engaging in these activities.



Dr. Reginald Webster writes: In the course of his long association with the Children's Hospital, Melbourne, I learned to know and appreciate the late Gerald Weigall, whose perennial freshness and optimistic outlook exerted a tonic effect on patients and friends alike. His passing removes from a sphere in which he laboured conscientiously and ever cheerfully, a graduate of the University of Melbourne of more than fifty years' standing, and one of the oldest members of the Victorian Branch of the British Medical Association.

For the greater part of the period during which he served the Children's Hospital, the members of the honorary staff of that institution each took the whole field of pædiatrics as his province, but in the reorganization which was initiated by the separation of medical from surgical clinics and evolved as the highly specialized system of the present day, Gerald Weigall was appointed honorary physician attending out-patients in 1920. He resigned this office in 1925, having completed thirty years of loyal and unbroken service to the hospital.

Contact with Gerald Weigall was always refreshing; he was possessed of an apparently inexhaustible fund of humour and anecdote, and drew upon this store with a natural ease of expression and sense of the appropriate which gained for him a reputation as a facile impromptu speaker. Although he was well established in practice for many years preceding the great expansion in laboratory medicine which I have witnessed, he was alive to its potentialities, and in this regard posed for me many a searching and well-reasoned question; his requests for laboratory assistance

were based upon the clear thinking and discretion which derive from alert clinical observation.

I can well imagine that important factors in his success in practice were his genial and stimulating personality, his appreciation of the human aspect of medicine, and realization of the necessity to consider illness in relation to the mental, social and economic background of the patient. By the exercise of these qualities he secured the confiding regard of his patients and no doubt frequently achieved more by their application than by writing a prescription.

Dr. Keith Chambers writes: I first had the pleasure and privilege of meeting Gerald Weigall in 1927 when I went into partnership with him at Brighton. I had just finished my residence at the Women's Hospital and knew nothing of private practice. I quickly found that I could not have had a better mentor.

Gerald Weigall was an exceedingly able general practitioner, widely versed and skilled in the numerous branches of medicine and surgery. He was a most able diagnostician and a careful and capable operator. He had a large general practice and was greatly loved by his patients. His sense of humour was highly developed and he loved his work and his life.

With his passing those of us who knew him well feel that we have lost something which we will be unable to replace.

ALAN HUBERT WHITE.

WE regret to announce the death of Dr. Alan Hubert White, which occurred on April 8, 1950, at Adelaide.

CALLANDER WADE SINCLAIR.

WE regret to announce the death of Dr. Callander Wade Sinclair, which occurred on April 17, 1950, at Longueville, New South Wales.

Australian Medical Board Proceedings.

NEW SOUTH WALES.

THE undermentioned have been registered, pursuant to the provisions of the *Medical Practitioners Act*, 1938-1939, of New South Wales, as duly qualified medical practitioners:

Abrahams, John Joseph, M.B., B.S., 1950 (Univ. Sydney), Ryde District Soldiers' Memorial Hospital, Ryde.

Akeroyd, Helen, M.B., B.S., 1950 (Univ. Sydney), Fremantle Hospital, Alma Street, Fremantle, Western Australia.

Alchin, George Charles, M.B., B.S., 1950 (Univ. Sydney), Ryde District Soldiers' Memorial Hospital, Ryde.

Alexander, Ruth Marie, M.B., B.S., 1950 (Univ. Sydney), 599 Pacific Highway, St. Leonards.

Angel, Henry Reece Tennant, M.B., B.S., 1950 (Univ. Sydney), Royal North Shore Hospital, St. Leonards

Baccarini, Antony Livio, M.B., B.S., 1950 (Univ. Sydney), Sydney Hospital, Sydney.

Bartlett, Brian Harold, M.B., B.S., 1950 (Univ. Sydney), Sydney Hospital, Sydney.

Beck, Keith Francis, M.B., B.S., 1950 (Univ. Sydney), Lewisham Hospital, Lewisham.

Bell, Richmond Baker Rikard, M.B., B.S., 1950 (Univ. Sydney), St. George Hospital, Kogarah.

Benecke, John, M.B., B.S., 1950 (Univ. Sydney), Saint Vincent's Hospital, Darlinghurst.

Bennett, Edward John, M.B., B.S., 1950 (Univ. Sydney), Saint Vincent's Hospital, Darlinghurst.

Bishop, Peter, M.B., B.S., 1950 (Univ. Sydney), Sydney Hospital, Sydney.

Boughton, Clement Russell, M.B., B.S., 1950 (Univ. Sydney), Sydney Hospital, Sydney.

Bourke, Terence Desmond, M.B., B.S., 1950 (Univ. Sydney), 38 Parliament Place, West Perth, Western Australia.

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED APRIL 8, 1950.[1]

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.[2]	Northern Territory.[2]	Australian Capital Territory.[2]	Australia.[3]
Ankylostomiasis	•	..	..	..	4	..	..	..	4
Anthrax	•	..	..	..	..	..	..	..	..
Beriberi	•	•	•	•	•	•	..	•	..
Bilharziasis	•	..	..	..	..	..	..	..	..
Cerebro-spinal Meningitis	1(1)	..	..	..	..	..	..	..	1
Cholera	..	..	..	..	..	..	..	..	..
Coastal Fever(*a*)	•	•	..	•	•	•	•	•	..
Dengue	•	•	•	•	1	•	..	•	1
Diarrhœa (Infantile)	..	..	2(2)	..	..	..	..	..	2
Diphtheria	13(7)	3	7(3)	..	3	..	..	..	26
Dysentery (Amœbic)	•	..	..	..	1	..	..	..	1
Dysentery (Bacillary)	•	3(3)	8(5)	..	..	..	..	..	11
Encephalitis Lethargica	..	..	..	..	..	..	..	..	..
Erysipelas	•	•	•	1(1)	•	•	..	..	1
Filariasis	•	..	..	..	..	..	..	..	..
Helminthiasis	•	..	•	•	•	•	•	•	..
Hydatid	•	..	•	•	..	•	•	..	..
Influenza	•	•	•	..	•	•	..	•	..
Lead Poisoning	•	•	..	•	•	•	•	•	..
Leprosy	..	..	..	..	..	..	..	..	..
Malaria(*b*)	..	..	2(2)	..	1	..	..	..	3
Measles	•	•	•	1(1)	•	•	..	..	1
Plague	..	..	..	..	..	..	..	..	..
Poliomyelitis	13(6)	4(2)	1(1)	40(30)	1(1)	..	..	..	59
Psittacosis	•	..	•	..	•	•	•	•	..
Puerperal Fever	..	1	..	..	..	..	..	..	1
Rubella(*c*)	..	•	..	•	..	..	..	..	..
Scarlet Fever	27(16)	11(7)	4(1)	11(2)	3(2)	..	..	..	56
Smallpox	..	..	..	..	..	..	..	..	..
Tetanus	•	..	..	•	•	•	•	•	..
Trachoma	..	..	•	•	•	•	•	•	..
Tuberculosis(*d*)	14(13)	5(5)	12(11)	1(1)	10(8)	..	..	..	42
Typhoid Fever(*e*)	..	..	..	..	..	..	..	..	..
Typhus (Endemic)(*f*)	..	..	1(1)	1(1)	..	..	..	..	2
Undulant Fever	..	..	1	..	..	..	..	..	1
Weil's Disease(*g*)	•	•	..	•	•	•	•	•	..
Whooping Cough	•	•	•	..	•	•	..	..	..
Yellow Fever	..	..	..	..	..	..	..	..	..

[1] The form of this table is taken from the *Official Year Book of the Commonwealth of Australia*, Number 37, 1946–1947. Figures in parentheses are those for the metropolitan area.

[2] Figures not available.

[3] Figures incomplete owing to absence of returns from the Northern Territory, Australian Capital Territory and Tasmania.

• Not notifiable.

(*a*) Includes Mossman and Sarina fevers. (*b*) Mainly relapses among servicemen infected overseas. (*c*) Notifiable disease in Queensland in females aged over fourteen years. (*d*) Includes all forms. (*e*) Includes enteric fever, paratyphoid fevers and other Salmonella infections. (*f*) Includes scrub, murine and tick typhus. (*g*) Includes leptospiroses, Weil's and para-Weil's disease.

Breinl, William, M.B., B.S., 1950 (Univ. Sydney), Balmain and District Hospital, Balmain.
Brierley, June Cooper, M.B., B.S., 1950 (Univ. Sydney), Balmain and District Hospital, Balmain.
Broadfoot, Eric Murray, M.B., B.S., 1950 (Univ. Sydney), Sydney Hospital, Sydney.
Brown, Judith MacArthur, M.B., B.S., 1950 (Univ. Sydney), 7 Abbotsford Road, Homebush.
Brown, Kenneth James, M.B., B.S., 1950 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.
Bull, Alan Stuart, M.B., B.S., 1950 (Univ. Sydney), Sydney Hospital, Sydney.
Burcher, Noel Frederick, M.B., 1950 (Univ. Sydney), Balmain and District Hospital, Balmain.
Burnett, Richard William, M.B., B.S., 1950 (Univ. Sydney), Royal South Sydney Hospital, Zetland.
Burns, Robert John, M.B., B.S., 1950 (Univ. Sydney), Manly District Hospital, Manly.
Byrne, John Justinian, M.B., B.S., 1950 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.
Campbell, Charles Haxton, M.B., B.S., 1950 (Univ. Sydney), Sydney Hospital, Sydney.
Carr, Kenneth Allan, M.B., B.S., 1950 (Univ. Sydney), Hornsby and District Hospital, Hornsby.
Casson, Phillip Rayner, M.B., B.S., 1950 (Univ. Sydney), Royal South Sydney Hospital, Zetland.
Chaffey, Calder Harold, M.B., B.S., 1950 (Univ. Sydney), Ryde District Soldiers' Memorial Hospital, Ryde.
Cook, James Cecil Murray, M.B., B.S., 1950 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.
Cope, Thomas Ian, M.B., B.S., 1950 (Univ. Sydney), Saint Vincent's Hospital, Darlinghurst.
Coppleson, John Victor Malcolm, M.B., B.S., 1950 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.
Cotton, Brian Drummond, M.B., B.S., 1950 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.
Crawley, Joyce Moncrieff, M.B., B.S., 1950 (Univ. Sydney), St. George Hospital, Kogarah.
de Coek, Nanette Marie, M.B., B.S., 1950 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.
Dixon, Ian, M.B., B.S., 1950 (Univ. Sydney), Hornsby and District Hospital, Hornsby.
Eggins, Barrie James, M.B., B.S., 1950 (Univ. Sydney), Royal North Shore Hospital, St. Leonards.
Elvy, Robert James, M.B., B.S., 1950 (Univ. Sydney), Sydney Hospital, Sydney.
Fallon, Peter Claude, M.B., B.S., 1950 (Univ. Sydney), Mater Misericordiæ Hospital, Crow's Nest.
Fenwick, Louis, M.B., B.S., 1950 (Univ. Sydney), Sydney Hospital, Sydney.
Ferguson, Edward Stephen Perry, M.B., B.S., 1950 (Univ. Sydney), Sydney Hospital, Sydney.
Fergusen, Wilga Jessie, M.B., B.S., 1950 (Univ. Sydney), Royal North Shore Hospital, St. Leonards.

Notice.

THE secretary of the State Committee of the Royal Australasian College of Surgeons announces that the visit to Australia of Sir Reginald Watson-Jones has been postponed indefinitely owing to his illness.

Nominations and Elections.

THE undermentioned have applied for election as members of the South Australian Branch of the British Medical Association:

Hill, Douglas Henry, M.B., B.S., 1949 (Univ. Adelaide), Royal Adelaide Hospital, Adelaide.

Lovell, Keith Everett, M.B., B.S., 1949 (Univ. Adelaide), Royal Adelaide Hospital, Adelaide.

The undermentioned have been elected as members of the South Australian Branch of the British Medical Association:

Beard, Donald Douglas, M.B., B.S., 1947 (Univ. Adelaide), SX700032 Major Donald D. Beard, B.C.O.F., G.H., Kure, Japan.

McEwan, Lena Elizabeth, M.B., B.S., 1949 (Univ. Adelaide), 18 Golfers Avenue, Seaton Park.

Brindal, Rosemary Barbara, M.B., B.S., 1949 (Univ. Adelaide), 33 Avenel Gardens Road, Medindie.

Coates, Dorothy Raville, M.B., B.S., 1949 (Univ. Adelaide), Royal Adelaide Hospital, Adelaide.

O'Connor, Diana Jeanne, M.B., B.S., 1949 (Univ. Adelaide), Royal Adelaide Hospital, Adelaide.

White, Rodney Gordon, M.B., B.S., 1949 (Univ. Adelaide), "Deepacres", Melbourne Street, North Adelaide.

Russell, Ernest Alfred David, M.B., B.S., 1949 (Univ. Adelaide), Royal Adelaide Hospital, Adelaide.

Diary for the Month.

MAY 2.—New South Wales Branch, B.M.A.: Organization and Science Committee.
MAY 3.—Victorian Branch, B.M.A.: Branch Meeting.
MAY 3.—Western Australian Branch, B.M.A.: Council Meeting.
MAY 4.—South Australian Branch, B.M.A.: Council Meeting.
MAY 5.—Queensland Branch, B.M.A.: Branch Meeting.
MAY 9.—New South Wales Branch, B.M.A.: Executive and Finance Committee.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Honorary Secretary, 135 Macquarie Street, Sydney): Ashfield and District United Friendly Societies' Dispensary; Balmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phœnix Mutual Provident Society.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federal Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225 Wickham Terrace, Brisbane, B17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178 North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205 Saint George's Terrace, Perth): Norseman Hospital; all Contract Practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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